THE AUDIO-VISUAL HANDBOOK

FOR

INDIA

EDITED BY

DONALD F. EBRIGHT

INTRODUCTION BY

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MESTON TRAINING COLLEGE
MADRAS

Revised Edition

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THE AUDIO-VISUAL AIDS COMMITTEE

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PREFACE

IN planning this second edition of the Audio-Visual Handbook for India the editor has sought to include the new developments in the Audio-Visual field—both as to theory and practice. The basic purpose remains the same, namely, to produce a Handbook for the worker in India which presents the basic tools and fundamental techniques necessary for the communication of the Christian Message in church and school, village and city, hospital or social institutions. The Handbook does not claim to give a comprehensive treatment of any phase of the Audio-Visual movement. Many excellent books exist for further specialized study and they are suggested at the end of each chapter.

This Handbook is a Symposium in that a series of opinions have been drawn together. The list of contributors will indicate the widespread use of radio, Audio-Visual aids, and mass communications in India. Each writer is prepared by training and experience to discuss the assigned chapter. The editor appreciates the manner in which each writer co-operated in condensing material and providing stimulating chapters.

The Audio-Visual Aids Committee of the National Christian Council of India is indebted to RAVEMCCO (Radio, Visual Education, and Mass Communication Committee, Division of Foreign Missions, National Council of the Churches of Christ in America, U.S.A.) for making this Handbook possible. We record our deep appreciation to RAVEMCCO and to its Executive Officer, the Rev. W. Burton Martin.

The Audio-Visual Committee is the newest functional committee of the National Christian Council in India and has five full-time workers. Dr. D. F. Ebright is Executive Secretary in charge of the Central Office. The Rev. H. R. Ferger, Rev. R. G. Korteling, and Mr. Rano K. Mukerjee are Field Directors. Dr. James E. McEldowney is Director of the Radio Commission with particular responsibility for the Radio Ceylon broadcasts. These full-time workers are promoting the use of A-V Aids for the enrichment of the Church of Christ in India through established committees organized under the 14 Regional Christian Councils.

This *Handbook*, the quarterly bulletin, "A-V News", institutes and workshops, films and filmstrips, flannelgraph sets, posters,

pictures, drama, leaflet evangelism and music are effective tools when placed in the hands of trained workers for the purpose of extending the Kingdom.

In the Anglican Prayer Book the Benedicite opens with these words, "O all ye works of the Lord, bless ye the Lord: praise Him, and magnify him forever" If a twentieth century counterpart of the Benedicite was being written, it might well begin "O ye Radio, Film and Press, bless ye the Lord: praise him, and magnify Him forever"

DONALD F. EBRIGHT

LUCKNOW, U.P., INDIA
February 1955

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INTRODUCTION

WE have come a long way in accepting a variety of audio-visual aids (teaching material) in church and school. Pastors and teachers in general agree that good teaching demands the use of many valuable tools such as maps, charts, flat pictures, films, drama, puppets, records, school trips, etc. All these are aids to the pastor or teacher.

But there is a wide gap between intellectual acceptance of these instructional instruments and their consistent use by trained personnel. To bridge this gap is the task of administration on the local parish, regional and National Christian Council levels. Administration should mean "getting things done" This *Handbook for India* comprises thirty-eight chapters, each with suggestions for getting things done. The Editor, who is to be warmly commended for his excellent work, has taken as his basic theme a sentence which none will dispute, that is, "Our task is communication"

Communication is at best imperfect. India presents unique problems at this point. The vast majority of our people cannot read or write. They must, therefore, be reached with nation-building ideas. Fortunately, even illiterate people can be taught for not all learning is in books. Accordingly, radio, films, drama and posters must be more widely used in New India.

Let us consider the vastness of India, that is, Kashmir to Travancore and Bombay to Calcutta. India is heir to a rich and ample culture which educators must pass on to each new generation through the best methods of communication. Unless all parts of India share in this good work we shall not all benefit. This *Handbook* is a contribution to the sharing process which is so necessary for India with its continental proportions and vast population.

I commend the *Audio-Visual Handbook* of the A-VA Committee of the National Christian Council of India to clergy, teachers and others who are looking for an introduction to 20th Century communication tools for modern India.

RAJA MAHARAJ SINGH[1]

Raja Maharaj Singh, son of Rajah Sir Harnam Singh, comes from a family which has distinguished itself in Church and Government service. The Raja Sahib was High Commissioner for India in South Africa, 1932-1935; India Representative to the United Nations Assembly, 1946-47; and Governor of Bombay State, 1948-1952. The Raja Sahib's gracious wife, the Rani Sahiba is President of the National Young Women's Christian Association of India.

Chapter I

AUDIO-VISUAL AIDS IN INDIA

DONALD F. EBRIGHT[1]

THE adoption of the term *communication* by audio-visual leaders marks a new development in an important movement. How truly we can say, "Our task is communication. We've a story to tell to the nations".

The study of communication has been going on in various fields such as education, sociology, political science, psychology, philosophy, linguistics, journalism, advertising, cultural anthropology, aesthetics, radio, motion pictures, literary analysis and library science, but is now being brought together so that these diverse rivulets can converge into a systematic discipline. The theological student, pastor, church official or teacher cannot confine himself to any one field for an understanding of modern communication but must follow the studies in many areas as he considers the control, audience, content, techniques and effects of all communication media.

This view is as yet unfamiliar to some audio-visual practitioners who have developed skill in the operation of equipment but do not sense communication's role in the total ongoing programme of the Church. The truth is that the audio-visual movement has grown up. In 1945 audio-visual workers made surveys of the number of projectors in an area, the budgets for new equipment and availability of material. Today A-VA literature is full of "The Consequences of Surrogate—Making for the Perceiver and the Producer", "Status as a Determinant in Response to a Film", "The Transactional vs the Objective Theory of Perception", or "The Effects of Preparatory Communication in Modifying Subsequent Attitudes Toward Stressful or Frustrating Situations".

At first thought, problems of communication appear to be of secondary interest to the theologian or philosopher. But communication does not refer to verbal, explicit and intentional transmission of messages alone; but includes all those processes by which people

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influence one another. Hence all actions and events have communicative aspects as soon as they are perceived by a human being. When people convene in groups, committees, synods, councils or congregational services, things happen.

What is the basic structure of communication and how will it help the worker in India? The classical description of the process of communication runs something like this:

1. WHO?
2. SAYS WHAT?
3. BY WHAT MEANS?
4. TO WHOM?
5. WITH WHAT EFFECT?

Looking at India it is obvious that some consideration has been given to step No. 1, "WHO", in seminaries and schools for the training of religious workers. Step No. 2, "SAYS WHAT" (content), has monopolized conferences, conventions and institutions with the result that "the content of the message" has received over-time consideration. "BY WHAT MEANS" (Method), Step No. 3, has been relegated to the dark corner of chance. Step No. 4, "TO WHOM", has had considerable emphasis both by general studies, i.e., Bishop J. W. Pickett's Mass Movement Studies and specialized agencies, such as the Henry Martyn School of Islamic Studies. "WITH WHAT EFFECT', Step No. 5, has been virtually neglected. Here is a formula we can apply to every worker in India. We can apply it to our own work in a variety of situations. No more important task confronts the Church of Christ in India today than that

of mastering the principles and methods of effectively communicating the Christian Gospel. Communicating the Gospel is the process of sharing ideas and beliefs, attitudes and motives, habits and ways of living, in order to develop Christian persons in a Christian community.

Thus we see that communication, at best, is a two-way process. In the Middle Ages, adults depended upon ballad singers, minstrels, jesters and group actors for entertainment, information and orientation (interpretation of experience). This was a face-to-face situation and the reaction of the listener might cause the story-teller to expand or soften his tale. In addition there was the market place, church and the inn. Travelers and merchants brought general news for the public while special couriers carried information for the nobility and clergy. Communication was direct with ample opportunity for what is called today "feedback" (What the communicator receives back from his audience).

In such settings the listener could register pleasure, disbelief or boredom. Hence without the sharing of reactions and ideas individual and group development is limited. "WHO", must know, "WITH WHAT EFFECT" his "SAYS WHAT" is being received. This sharing must go on between pastor and layman, teacher and pupil, parent and child, Christian and non-Christian neighbor.

In the June, 1954, bulletin *Evangelism,* published by the Secretariat for Evangelism, World Council of Churches, the following comment is made on the media of mass communication: "(1) Recognizing the strategic importance of this development, organizations are being set up in different countries to use these aids in the communication of the Gospel. (2) The fear is being expressed that the evangelistic activity of the Church which is already so impersonal will, by this new development in mass communication, become more so."

The mind of Christ must always be the basis of our thinking of communication media. He combined the most personal methods and the most impersonal in order to reach more people with His message. We find evidence of this in *Mark* 4: 1, where He used a boat, the only instrument at hand by which He could make His message heard by a larger number of people. He used any media then available for mass communication. St. Mark records: "Again He began to teach by the sea. And a large crowd gathered about Him; so that He got into a boat and sat in it on the sea; and the whole crowd was beside the sea on the land" Jesus knew He could reach more people if He spoke to the crowd from the boat. He left a face-to-face relationship and deliberately addressed a crowd. Today's use of the microphone, film, press, radio beam and TV screen is that we may reach more people with our Lord's message.

The early Church used oral preaching, letter-writing, personal

witness and the fellowship of the believers. Later the church utilized other media: the liturgy, paintings, drama, sculpture, architecture and music. Through 500 years marionettes enacted the roles of the Holy Family, saints and martyrs. Other visual stimuli were added: stained glass windows, relics, candles, vestments and the rosary to teach religious lessons.

With the Renaissance the visual-sensory concept began to flourish. Art developed, travel and discovery prospered, and modern technology produced a process for making paper and movable type. Consequently the means of communicating the Gospel were revolutionized. In our generation we have seen a further development of communication technique with the advent of (1) modern multi-color illustrations; (2) photography; (3) motion pictures; (4) radio and (5) television.

There are a few who show concern over the increased use of the media of mass communication and refer to the man-to-man days of the first century with a sad nostalgia. But we realize that the Church today is set in the midst of a vastly changed cultural context. This new context has disquieting implications for the way the Church in India can communicate effectively. Free India, with its deep, surging spirit of Nationalism, resurgent Hinduism and rapid industrialization offers a context in which old channels of communication must be abandoned and new methods chosen because of the revolutionary nature of human relations in today's world. Intense competition exists in the battle for men's minds. There must be a greater understanding of the unique role of each of the older and newer methods of communication and a strategy developed for combining them in a bold effort to communicate the Gospel.

Prior to 1948 the use of audio-visual aids in India was individualistic and desultory. Missionaries brought equipment which they used in their denominational programme. There was no co-ordinating organization whereby the work of denominational and regional pioneers could be brought to the attention of others who were seeking answers. Each missionary came to India with the theology of his seminary, the discipline of his denomination and communication tools of his decade. Between 1918 and 1928 audio-visual aids were in an early developmental stage but missionaries were introducing "New tools" to their 1908-1918 senior-colleagues who questioned the "high-falutin" vocabulary and "dangerous innovation" of the "magic lantern and picture-roll" 1928-1948 might be called the later developmental period with 16 mm. film, amplification and non-projected aids being used increasingly. The post-World War II missionaries educated in a dynamic audio-visual ethos came with new and perfected tools making the once 1918-1928 "radicals" remark that "missionaries once came with a Bible under their arm, now they have a camera over their shoulder".

In the Fall of 1946 the Foreign Missions Conference (FMC) set up an Audio-Visual Aids Committee for work overseas and later a World Radio Committee. In December, 1948, the FMC sent a three-man deputation to make a study of Asia. Dr. S. Franklin Mack, Rev. Everett Parker and Mr. Niklaus Hagman visited India in March and concluded their survey with an All-India Conference in Allahabad, April, 1948. This stands as a landmark in India's Audio-Visual history because it was in the Allahabad Conference that the statesmanlike Dr. Rajah B. Manikam led the group to organize an Audio-Visual Aids Committee under the National Christian Council of which he was then Executive Secretary. The Methodist Church in Southern Asia loaned the services of Dr. Donald F. Ebright to be Executive Secretary; the North India American Presbyterian Mission loaned the services of Rev. H. R. Ferger as Field Director for North India; and the Arcot Mission and Diocese of Cuddapah loaned Rev. Ralph G. Korteling to be Field-Director for South India so that the organized programme started with three full-time workers.

The first informal meeting of the NCC A-VA Committee was held in Jabalpur, October, 16, 1948. Present were: Dr. R. B. Manikam, Dr. Donald F. Ebright, Mr. V. M. Koshy, Rev. H. R. Ferger, and Rev. R. G. Korteling. Rev. Theodore Essebaggers and Dr. J. E. McEldowney were consultative members. The Committee was privileged to have as a guest Miss Sue Weddell, New York, Secretary of the India Committee of the FMC of North America. She discussed the latest developments and announced that a new functional committee was being organized. Thus India first heard of RAVEMCCO (Radio, Visual Education, Mass Communication Committee, of the Division of Foreign Missions of the National Council of Churches of Christ in the U.S.A.). The first regular meeting of the A-VA Committee was held in the Christian Council Lodge, Nagpur, Feb. 26, 1949, with Dr. R. Ben Gullison, Chairman, and Dr. and Mrs. R. B. Manikam as hosts.

From the first the A-VA Committee centered its programme around the needs of the Church with pastors, teachers and evangelists in mind. Among the first steps were: (1) the introduction of a *training programme* THROUGH conferences and workshops; (2) the *production* of simple, inexpensive non-projected aids for the village worker; (3) an audience-reaction research project in Hyderabad State; (4) demonstration of many aids and a positive message that there is "no *one* aid"; (5) the establishment of film libraries in North India and South India; (6) the publication of the *Audio-Visual Handbook for India* (D. F. Ebright, Editor, 1950, Wesley Press, Mysore City); (7) a quarterly bulletin, "A-V News"; and (8) an emphasis upon National Leadership which lead to the selection of Mr. Rano K. Mukerjee for graduate study in the United States. Later, Mr. J. C. Lyall, Allahabad, attended the same graduate department of Ohio

State University where Dr. Edgar Dale has set up a programme most congenial for foreign students. Because expensive equipment is not always within reach of the majority of Churches and workers the A-VA Committee emphasized the production, distribution and use of simple aids. Dr. Ebright's first trip South was to Madras where he presented his 22 pages of rough sketches which Miss I. Warren reduced to 10 pages of art-work which became the popular "Life of Christ" flannelgraph set which was produced in co-operation with the India Sunday School Union.

The first All-India A-VA Conference, held in Raipur, M.P., November, 1951, was a second landmark. Thirty-five delegates representing every section of India spent three days evaluating the past and projecting a programme for the future. (1) The Poster Conference, sponsored jointly by the Committees on Literature and Audio-Visual Aids; (2) the Radio Conference, sponsored jointly by the Council on Evangelism and the A-VA Committee; (3) Rev. R. G. Korteling's promotional trips to Ceylon; (4) Dr. D. F. Ebright's three-month tour in 1953 as a member of the RAVEMCCO deputation to Africa; (5) Rev. H. R. Ferger's film and filmstrip production and the outstanding Sales Depot in Allahabad; (6) Rev. D. J. Saunders' *Filmstrip Handbook for India* (1954, Diocesan Press, Madras); (7) Mrs. H. T. Fishman's *Hand Puppets* (1952, Wesley Press, Mysore City); (8) Dr. J. E. McEldowney's production and direction of "The Transformed Life", a 16 mm. film with Hindi sound track; and (9) the organization of a full-year Audio-Visual Training course in co-operation with Leonard Theological College, Jabalpur, are among the peaks which form the NCC's range of communication. November 28, 1954, the date the Secretary sent a signed contract to Radio Ceylon and Wednesday, February 1955, when the NCC presented its first 30-minute radio broadcast brings the list of achievements to date. The radio programme is the result of a team: Dr. Roland W. Scott, Dr. James E. McEldowney, Mr. Gilbert Galloway, Mr. Venu Macwan, Mr. R. K. Mukerjee, Mr. Kuruvella Jacob and Dr. Donald F. Ebright.

This *Handbook* goes to press on the eve of the first All-Asia Conference on Mass Communication which will be held in Bangkok, March 2-8, 1955. Whatever report India may present, the credit will go to the FMC Deputation, RAVEMCCO and the host of Nationals and missionaries who have yearned for better tools to communicate the story of God's redemptive love in Christ Jesus.

One chapter is an inadequate vehicle to convey the widespread use of Audio-Visual Aids in India. Village pastors using flat picture sets to the Life of Christ; illustrated leaflet evangelistic campaigns; newspaper evangelism; drama in village church and school chapel; teachers utilizing posters, charts and models; flannelgraph seen combining the power of a picture with the interest of a drama; puppet plays for village uplift; a literature committee co-operating in the

production of posters; mobile units with a full range of equipment; the Christian Home Movement enriching its bulletin through the finest Indian Christian art; a public address system lifting a great *bhajan* beyond the last compound wall and vibrating its saving message into a circle of searching hearts; Christian Half Hour, the N.C.C. radio programme, beaming its message of information and inspiration from Ceylon to Pakistan; adult literacy workers using the Laubach charts which would be futile without the visuals; the Greatest-Story-Ever-Told illuminating a screen with dignity and power as a 16 mm. sound film becomes the instrument of the Holy Spirit confronting sinful man with the claims of discipleship—these combine to form a picture of a Church able to recover its initiative to seek and save those that are lost and achieve a mobility atune to our fluid 20th Century. Our task is Communication. "We've a story to tell to the Nations."

Chapter 2

WHY USE AUDIO-VISUAL AIDS

RALPH G. KORTELING[1]

THE most useful concept in considering audio-visual aids is that of communication. Nothing is more important in the world today than the transmission of ideas from one person to another. We are living in an age of global wars but the greatest of them are not fought on the battle-fields but in the minds of men and involve the whole gamut of communication-techniques. The story of communication is intertwined with the history of civilization and culture. As teachers and leaders in the church we do well to make it a subject of special study.

THE CONCEPT OF COMMUNICATION

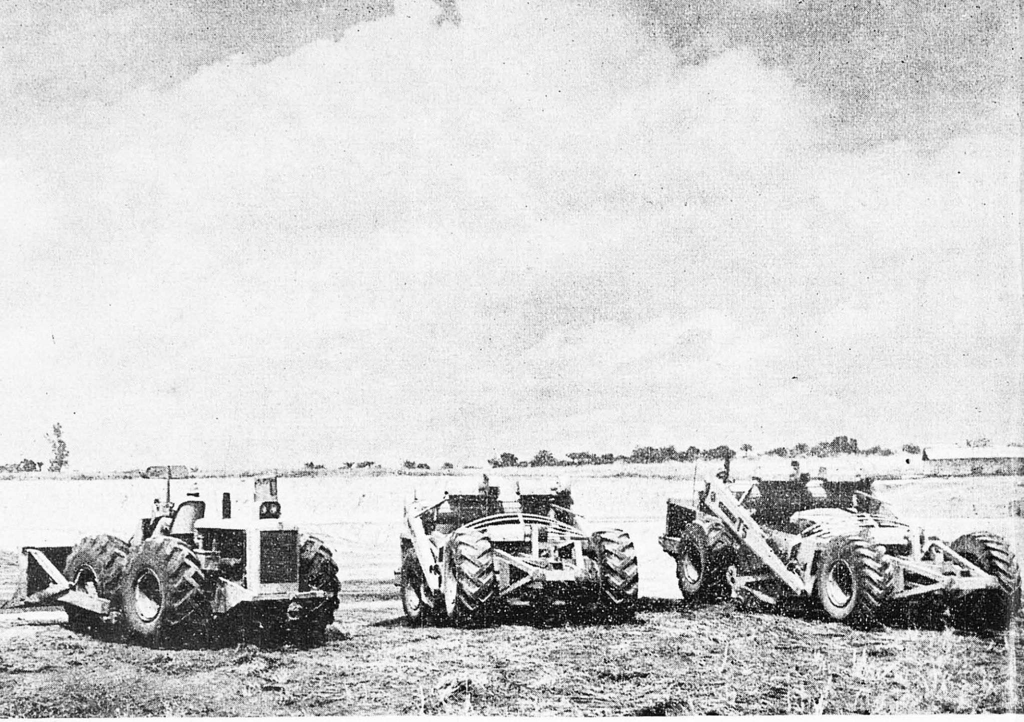
In the imperial city of Rome in the year 60 A.D., a saint who was also a prisoner for Christ's sake dictated a letter to groups of his followers several hundred miles away in Asia. An important thought that he mentioned in the letter was this, 'Have this mind in you, which was also in Christ Jesus.' You will immediately see three outstanding elements involved in this simple sentence,—first, the mind of Christ—second, Paul's understanding of that mind,—third, his desire to recreate his understanding of the mind of Christ in the minds of the Christians of Philippi. Let us analyze this situation in order to get a more comprehensive idea of the meaning of communication.

1. The Apostle Paul had an idea which he wanted to communicate to others. In that respect he represents us all. We who, like Paul, are followers of the Christ have a sincere desire to pass on the message of our Lord to others.

2. This idea that Paul wanted to pass on to others he himself acquired in many ways. He heard about it from James and Peter, the immediate disciples of the Lord. He saw it enacted in the lives of Christ's followers, especially in the death of Stephen whose

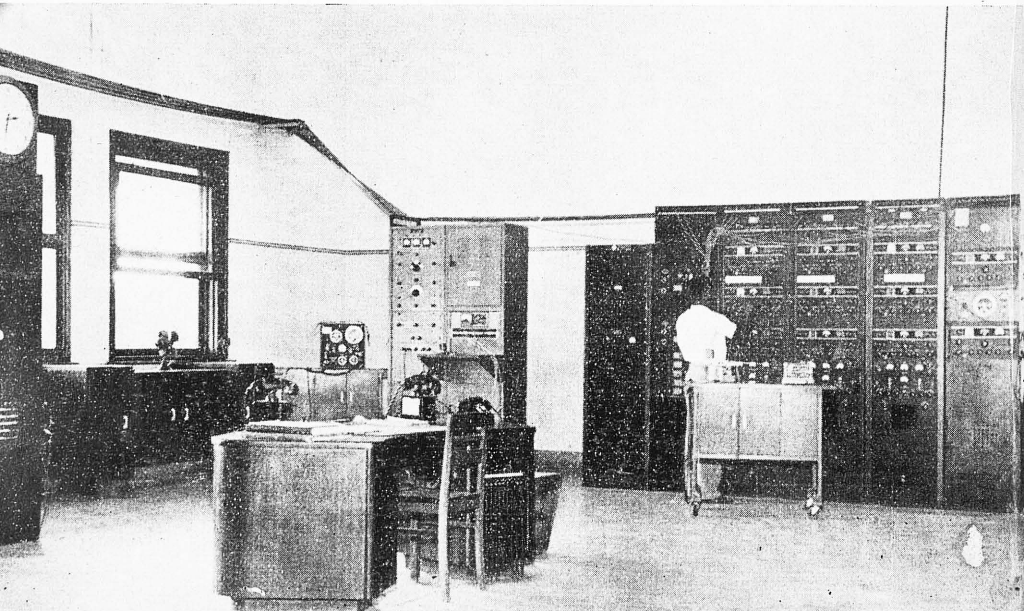
[1] The Rev. Ralph G. Korteling, M.A., B.D., Punganur, Chittoor District, is loaned by the American Arcot Mission, the Reformed Church in America, and the Cuddapah Diocese, C.S.I., as Field Director for South India of the A-VA Committee of the National Christian Council.

How would you explain this African mask the Bapende tribe of the Belgian Congo to your class without a picture?



Would your class understand the word "Tournadozer" without a picture?

"What is a control panel?" Pictures help.



martyrdom he attended. He received it by revelation on the road to Damascus. He may have read some early correspondence on the subject. He certainly participated in it in the fellowship of the church. There is no doubt he meditated on this subject a long time. In various ways the concept of the mind of Christ was born and developed in the mind of Paul.

3. In order to realize his purpose the apostle used the media of a written message. In the mind of Paul the message and ideas were conceived with the help of the Hebrew, Greek, and Aramaic languages but he dictated to his amenuensis using the symbolism of Greek words and sentences.

4. During the process of this dictation the vibrations that left the vocal organs of the apostle struck the hearing organs of his writer, were transferred to the brain, and had to be formed in some marvellous way into thought.

5. The next step in the process of communication relates to the ability of Paul's amenuensis to write correctly on parchment the thoughts of Paul's mind which had to pass through his own mind before he could translate it into symbols that the Christians of Philippi could understand.

6. I have no doubt when the letter was finished Paul asked to have it read back to him so he could judge as to its correctness before sending it on its long journey. Even with the greatest of care errors can easily creep into such complicated procedure as this.

7. It may have been that after prayer and fond farewells Epaphroditus took this letter from the hands of Paul to deliver it to the Christians of Asia. Whether he went all the way by land, or part of the way by sea we do not know. Someone was personally charged to carry the parchment across the hundreds of miles from Rome to Asia. It must have taken weeks if not months before the little community of Christians at Philippi received the precious document.

8. In Asia the steps in this process of communication had to be repeated in reverse order. Someone received the letter, looked at the symbols of the Greek language, and ideas began to register in his mind. These ideas were given appropriate sound vocalization so that the gathered assembly could hear.

9. Finally the idea in the mind of Paul was recreated in the mind of the Christians in Asia. It is hoped that there was a large approximation between the original idea in the mind of Paul a prisoner in Rome and his beloved friends in Asia even after the lapse of weeks and months.

10. But remember that this idea was originally in the mind of Christ. 'Let this mind be in you which was also in Christ.'

Let no one suppose that the above is a complete analysis of all the factors that enter into the process of communication. It is

intended to illustrate our problem of getting ideas across from one mind to another. Because we earnestly desire to be effective witnesses to the life and teaching of our Master we look to the science of communications for help.

DEVELOPMENT IN TECHNIQUES OF COMMUNICATION

As we have mentioned, the history of communications is contemporaneous with the history of man. During the thousands of years that man has been on earth he has improved the means of sharing thought and culture over ever-increasing areas of the world. The human voice is limited in the distance it can be heard. Tom-toms and kettle drums can be heard at longer distances. Fires lighted on hill tops can be seen for still greater distances. Symbols in the form of objects can be carried from tribe to tribe to indicate peace or war. Pictographs are among the earliest means of written communication. These were often made on clay and allowed to harden in the sun. A great library of 25,000 clay tablets has been unearthed at the ancient city of Nineveh. The sacred carvings of priests called hieroglyphics evolved into ideographs. About the year 1000 B.C. the alphabet was invented and great advance was made in preserving records as well as sending messages to remote places. From that epochal event to the next great invention in the art of communication 2,500 years elapsed. In 1456 Johannas Gutenberg built a press using movable type and the first book to be printed was the Bible. Block printing was developed long before this date, but the middle of the 15th Century has been accepted as the beginning of mass communications. Since then all the techniques of printing have been greatly improved and the industry expanded till today in the United States of America alone more than 20 million tons of paper is consumed in the process annually. In that country more than two and a half million dollars are spent every year for printing rotogravure and photo-engraving. The mammoth printing presses of the modern world, never cease by day or night to literally cover the world with newspapers, magazines and books of all kinds and descriptions. Think what it means to print the Bible in 1175 languages!

PICTORIAL COMMUNICATION

It is not only with the symbolism of words that communication takes place. The wise Chinese of long ago realized that "one thousand hearings are not as good as one seeing". That which leaves the greatest impression on our minds is what we see with our eyes. The fact of the matter is that our alphabet grew out of picture writing. So useful was the new technique of printing that educators lost sight for a time of the basic element of "seeing" After centuries

of neglect the "visual" is again in prominence in the world of communication.

Through scientific inventions and improvements of optical systems and the process of photographic reproduction realistic pictures are seen in almost every home in the world today. Although this great advance in graphic communication is little older than the present century, we too often forget how drab would be our newspapers and magazines without pictures. It may be we underestimate the volume of photographs that are passed around from friend to friend and are sent across the world by international postal services. Those of us who live in village India know that more people see cinema pictures than read the daily press. The government has done wisely by insisting on documentary films being shown at every performance in commercial cinema houses. Young and old, literate and illiterate learn from pictures.

Simulated to duplicate first-hand experience as closely as possible the inventiveness of man worked on the problem of colour photography till it was perfected. Great strides are still being made in colour reproductions of photographs, transparencies, motion pictures, three dimensional photography, and colour television. No wonder that TV sets have become so popular in countries where television is available. One has the thrill of welcoming the world's celebrities, see them and hear them, in one's private home. Truly this is an age of vivid and accurate communication.

ELECTRONIC COMMUNICATION

Radio has become so common that we forget that the first radio network was set up in New York in 1926. Some of us remember how fascinated we were with the crystal sets we played with as children picking up very local broadcasts. Today we listen with ease and facility to world encircling broadcasts. It was in 1873 that Bell transmitted the first telephone message by overhead wires, and in 1895 that Marconi first sent and received wireless messages. Today we talk by land, sea, and air by radiogram to all parts of the world.

"Evangelism is the ministry of reconciliation, it is what we are to do when entrusted by God with the communication of the Good News to other people like ourselves." Thus writes Roland Scott in "Ways of Evangelism" "Entrusted by God with the communication of Good News," that is it. The responsibility rests upon every local church and every Christian. The greatest miracle of communication has been effectively accomplished by God Himself when he sent Christ into this world to fulfil the loving purpose of reconciliation. After receiving this gift for ourselves it is our privilege and responsibility to pass it on to others. We are to be communicators of the Eternal's message of life and love to our neighbours, "teaching

them to observe all things whatsoever I have commanded you". This process is effective in so far as they too become "disciples". It is a fascinating task in which we must use every tool at our disposal, every physical and spiritual aid that is worthy and effective in attaining the goal.

WHAT ARE AUDIO-VISUAL AIDS?

MISCONCEPTIONS

There may be those who look upon audio-visual education as a new fangled method of teaching. Nothing could be further from the truth. This type of learning preceded the dawn of history. It is basic for all times and all peoples. It is the way we naturally learn.

Others may think that audio and visual education are primarily means of entertainment. This idea is derived from the wide use of cinema in the commercial entertainment field. While there is no valid reason why education should not be made a pleasant experience, and every reason why it should, the use of audio-visual materials in schools and churches is not primarily entertainment but good methodology in teaching, preaching and evangelism.

Some may think of these aids as a separate subject field by itself. They fail to recognize that they are only a tool in the hands of the teacher or leader to be used at the proper time and for a definite purpose in the complete programme or outline for teaching. By all means they should be integrated into the lesson outline or worship programme or preaching plan. They have their definite place and time, and should be used in conjunction with other means of teaching and preaching.

Likewise they are not a substitute for the teacher or class leader. They are not used in place of a text book. The teacher or the preacher is still the prime factor in communicating ideas. No machine or method can take the place of the personal factor in teaching.

Still others may be under the misconception that audio-visual materials are easy to use. The opposite is more likely the case. They are more expensive and more exacting in their use than words. They have to be carefully selected for definitely designed goals. They have to be made and that is time consuming. Once made they may be used over and over again. They do make the presentation of the lesson easy and attractive but they require great thought and skill in their preparation and use.

DEFINITIONS

Many books on the subject avoid giving a formal definition of audio-visual aids but build up the whole concept by discussing various

materials and their special uses. The field is too large to be covered adequately by a terse, simple phrase. Some speak of "audio-visual education", others of "sensory aids", but probably the best general term is "audio-visual communication". Dent says the field is covered by "All materials used in the classroom, or in other teaching situations, to facilitate the understanding of the written and spoken word". Dorris gives the following definition, "Visual education simply means the presentation of knowledge to be gained through the 'seeing experience'" A definition with a psychological slant is that by Roberts, "Visual education is a method of imparting information which is based on the psychological principle that one has a better conception of the thing he sees than of the thing he reads about or hears discussed." The factor that we must keep in mind is that these are "aids" or "tools" to perceptual learning that must be used thoughtfully and skilfully.

CLASSIFICATION

One classification that is easy to remember is the following:

1. Projected aids
   Still pictures, slides, filmstrips, moving pictures (either silent or sound), etc.
2. Non-projected aids
   Sand tables, chalk boards, models, maps, globes, flannelgraphs, puppets, pictures, graphs, dioramas, objects of all sorts, etc.
3. Sound effects
   Gramophone recordings, transcriptions, radio, public address systems, tape recordings, etc.

WHY USE AUDIO-VISUAL AIDS?

We may profitably ask, "What definite gains are attained by the use of audio-visual aids in our teaching and promotional efforts"? The question is not whether to use or not to use these materials. The modern world has decided that question for us and we are out of touch with the times if we do not use them. Mass communications abound on all sides. Even an illiterate villager sees a picture on his

ninepie match box. At election time political parties use pictorial symbols of language. The first lesson in reading begins with a picture of a fly or a cow or a dog. The most important news feature of the day is presented in our newspapers with photographs. Advertisements without colourful and appealing pictures are drab and ineffective. Technical articles in magazines such as those in medicine, architecture, engineering, agriculture, veterinary, health services, dentistry, x-ray, are profuse with high class illustrations. Displays are planned for places where crowds of people gather such as at cattle fairs, industrial exhibits, art exhibits, educational gatherings, religious conventions. Even as you read this page the air around you is filled with mass communication messages. All you need is the proper instrument to flood your mind with music and information. In some parts of the world it is a common practice to pull out of the air pictures of what is happening hundreds of miles away. The recent eclipse of the sun was seen in the United States of America on television sets far removed from the belt of actual vision of this event. The total situation in the world today is such that anyone who wishes to reach large numbers of people with a message must use audio-visual aids. The question we can profitably raise is "Why it it that these sensory materials are so extensively used today?"

AUDIO-VISUAL AIDS FACILITATE LEARNING

In order to appreciate these teaching materials we have to keep in mind that experience with concrete objects facilitates learning. The alternative is to learn from abstract symbols, spoken and written words. We learn more easily and accurately by seeing and handling sensory materials such as pictures, specimens, charts. Spoken and printed words are fraught with the dangers of "verbalism",—the use of words that are not clearly understood. Confusion results and learning is hampered. Seeing a milking machine in action is far more instructive than reading about it. Abstract thinking is the result of training, and is built upon experience with concrete reality. The emphasis in conveying ideas should be upon the use of concrete teaching materials.

AUDIO-VISUAL AIDS MOTIVATE PEOPLE

When people see something they need they are interested and such materials take on new meanings for them. To supply a felt need is basic in transference of ideas from one mind to another. Motivation is not something added to ordinary learning to speed it up. The fact is that no real learning takes place without motivation. Motives may vary in effectiveness. To be regular in attendance in order to be on the honour roll is not as good a reason as keen interest in the subject matter taught. To work for a "pass"

is not as valuable a motive as mastery of the subject. Audio-visual aids arouse curiosity and further exploration, leading on to better understanding. The science laboratory is an example of an audio-visual workshop where great discoveries have been made enriching the life of all people. The concrete manipulations of laboratory techniques motivate and stimulate investigation and discovery.

AUDIO-VISUAL AIDS HELP RETENTION OF LEARNING

One of the outstanding inefficiencies of teaching, preaching and communicating is that people forget so easily. Think what it would mean if children and adults would remember 25% more than they do now. Audio-visual aids not only accomplish effective learning in less time but what is learned in this way is remembered longer and better.

From what has been written it is evident that the fundamental question is not "Why use audio-visual aids?" But, "Am I really concerned about effectively communicating thoughts and ideas?" To those charged with passing on the greatest story ever given to man, to all Christians and especially Christian teachers and preachers the challenge is inescapable,—use all worthy and effective aids to establish in the heart and minds of young and old the Good News of God's love and redeeming grace.

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Chapter 3

SOME OBSERVATIONS ON COMMUNICATIONS THEORY[1]

DALLAS W. SMYTHE[2]

WHAT do we think we know about the effects of mass communications (motion pictures, radio, television, newspapers, magazines and books)? Research in a number of academic disciplines and in the business organizations of the United States has been increasingly directed towards this question in the past 20 years. Without attempting an over-all synthesis, this essay is addressed to the logic of research in the communications field, and to its value systems.

I

Our common sense tells us that these agencies of mass communication have had enormous effects. It has been observed for several decades how the Hollywood motion pictures have affected the peoples of the world. It could never be forgotten how a Hitler and a Roosevelt obtained effects through the use of radio. The social revolutionary history of the past hundred years would testify to the effects of the pamphlet, the book, and the newspaper in facilitating the creation of certain kinds of public opinion. And in its short history to date, television has demonstrated in the United States its undoubted power to effect changes in people's behavior if only through changes in their use of time in looking at it.

Yet withal, can social scientists parallel this common sense observation with the corresponding "laws" of communications? The answer must be: They can not. What, then, is the reason for this? What are the prospects for their doing so?

My thesis is a compound of a series of interrelated propositions: (*a*) that we are a long way from being able to codify the laws of communications; (*b*) that one of the reasons for this state of affairs is an

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immaturity in research methodology manifested in "scientism"; (*c*) that a mature situation in communications research would balance empiricism with a methodological "open-door" policy, welcoming, with the stature of "science," observation and logical rigor outside the controlled-experiment situation; (*d*) that in this field possibly more than most others the ethical value issues implicit in the normative aspects of communications research demand searching self-examination by scholars. If, in the course of a short paper, the proof offered for all of these related propositions seems scanty, then I must console myself that it may be worthwhile even to have stated and briefly elaborated the issues.

Our distance from being able to measure adequately the effects of communications may be illustrated in relation to the most substantial single empirical research work yet done in communications: *Experiments on Mass Communication,* by Hovland and others (4). This report on experiments in the training and indoctrination by film of the American soldiers in World War II shows that films were quite effective in imparting skills of the "nuts and bolts variety" but that for changing attitudes toward the war films produced very little change in the intended direction. For altering motivation the films showed practically no effect. While we have many suggestive clues which may shortly lead us to more sweeping generalizations than these, the Hovland report typifies the present state of affairs. Obviously our experimental approach has thus far yielded results which are by no means commensurate with the common-sense judgments as to the effects of communications, illustrations of which were given in the second paragraph.

Among the several contributing factors to this state of affairs, "scientism" is not least. The bulk of the research in the interdisciplinary field coming to be known as "communications research" has been in the hands of persons who more or less consciously adopt the stance of "scientism". By this I mean that they will accept as "knowledge" only what has been demonstrated through "controlled experiments"; and that their assumptions and preconceptions are often inexplicit and seriously biasing.[1] One of the more serious of these preconceptions has been that there is a simple cause-and-effect relation between the content of the mass media and the behavior and attitudes of the audience.

While doubtless unintended by Hovland and his colleagues, their virtuosity in the use of controlled experimental methods has to some extent provided a model for a "scientistic" approach to later communications research. Thus an otherwise admirable survey of

[1] A salutary experience in this connection is to re-read, Thorstein Veblen's essays on methodology, "Preconceptions of Economic Science," in *The Place of Science in Modern Civilization* (13).

the literature of social science on communications effects performed by Joseph T. Klapper is marred by scientism (6). This survey was conducted to provide answers to certain policy-oriented questions posed by the director of the Public Library Inquiry, a Social Science Research Council project devoted to analyzing the position of the public library movement in the United States. One question posed for Mr. Klapper was whether a plethora of escapist entertainment is conducive to social apathy. Mr. Klapper finds some "evidence" to support the view that escapist material provides "relaxation," "compensation," and that it sometimes has a "boomerang" effect which is personally and socially harmful. But when he comes to the "safety valve for social tensions" hypothesis, he summarily denies that a social apathy effect of escapist entertainment has yet

> . been demonstrated by any direct evidence. Nor could any evidence be adduced except by the most prolonged and elaborate experiment or survey. In the absence of such evidence, then, the thesis remains a thesis,—a conjecture held in common by acute observers, but by no means an established fact. (6: III-12).

He admits the "probability that mass media tend to sanctify the status quo," but argues that this tendency is "the result of various forces rather than the product of escapist communication alone."

Perhaps the semantic stance in which the question was posed is responsible in part for the nature of the response. But this passage illustrates the crippling effect of an assumption that the only evidence worthy of credence must come from the laboratory blessed with statistical measures of variance. Neither in the social nor the physical sciences can the validity of information be tested by whether it is "an established fact" in the sense used by Klapper. This fallacy is the essence of scientism, and its exposure as a fallacy hardly needs documentation.[1] For Mr. Klapper, moreover, multiple correlations of forces produce "evidence" in a "laboratory," but not outside. The evidence from the fields of history, sociology, political science and economics is ignored as being unfit for acceptance as "science." Here we have scientism serving to obscure.

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[1] A recent affirmative statement on this fallacy by two psychologists might well put a quietus on it:

> Philosophers, educators and scientists have perhaps written more truth and nonsense about "The Scientific Method" than about any other single subject of common concern. . The scientific method is at some time or other all things to all scientists. There is no such thing as *the* scientific method. It is more accurate to speak of science as a kind of adaptive behavior resulting from the special assignment which a certain class of people set for themselves. The assignment for the scientist is to apply himself to a domain of events in order to achieve so much understanding of it that his control of it and the predictions he makes about it will occur with a minimum of surprise (i.e. "error") . There can be no rules or presumptions that will be invariant from scientist to scientist; effective solution of this problem as of any other problem may be tried via manifold routes. (7: 14-15).

Lest this illustration be thought too slender a basis for my conclusion, let us look to Klapper's answer to the question: How is persuasion with regard to important civic attitudes carried on with the greatest likelihood of success? Here, to be sure, Klapper does use evidence derived from observation of social institutions (8) to support the view that the monopoly propagandist operates under conditions of maximum likelihood of effect. But his naivete in methodology is evident in his apology for the fact that "the 'research' on this topic has included no controlled experiments. . . ." (6: IV-21) To accept institutional observations as *exceptions* to the scientific "rules" of evidence is methodologically on a par with rejecting them for the same reason; in both events their validity is unrecognized.

Mr. Klapper's study also provides us with an example of the unconscious or at least unacknowledged normative bias which often accompanies "scientism." In considering how the public libraries might use the monopoly propaganda characteristics of the mass media to promote the libraries' cultural objectives, he *himself* uncritically accepts the status quo as unchangeable:

Because American mass media are controlled by commercial interests who are concerned with maintaining the status quo, monopoly propaganda in America *is and can be* directed only upon the reinforcement or activation of attitudes already almost universally sanctioned. [Emphasis added] (6: IV-38)

Had his theoretical stance been otherwise, obviously the question might have been answered in terms which regarded the mass media as communicating units the policies and organization of which change through time. Conceivably the public library movement might have found policy use for such an analysis which recognizes the nature of institutional change.

There is hopeful evidence that this constrictive view is being broken through. Thus Paul F. Lazarsfeld in his foreword to the Klapper report verbalizes the common feeling of frustration with the limited knowledge now available on communications effects. He says:

In some quarters, there is a feeling that if we only had more and better studies, the answers would be quickly forthcoming. But this isn't likely to be the case. The main difficulty probably lies in formulating the problem correctly. For the trouble started exactly when empirical research stepped in where once the social philosopher had reigned supreme. To the latter there was never any doubt that first the orator and then the newspaper and now television are social forces of great power. But when specific studies were made about the effect of educational radio programs or the influence of the library on the community, these facts could only rarely be demonstrated. It is possible, of course, that our measuring instruments are not yet fine enough. But most likely the difficulty is due to the nature of the effects themselves. (6: 1-2)

Moreover, recent studies have, as Franklin Fearing remarks, pointed the way out from the limitations set by the simple causal relationship preconception. Two studies in particular (2, 15) show that:

The viewer and listener are dynamic participants in the situation. They react *on* the content presented rather than reacting to it. How they react is deter-

mined by many factors *only one of which is the content of the film itself.* This is not equivalent to saying that film and radio have no effects. Rather, it raises the much more complicated question of what effects under what conditions. (3: 139-140)

To follow the implications of this conclusion is to widen the methodological outlook. For now it becomes relevant to hypothesize concerning the needs of members of the audience, concerning the character structure of the members of the audience, towards the institutional setting in which the audience exists—indeed towards all that can be meant by the concept of the dynamics of the personalities of audience members.

The theoretically self-conscious researcher is now invited to frame studies both in and outside of the controlled-experiment situation. For example, one might take account of the evidence about personality dynamics as given to us in *The Authoritarian Personality* (1). These social scientists were studying the general population—not avowed fascists—and were concerned with the analysis of the deep-lying as well as the surface aspects of prejudice. Quite aside from providing the communications researcher with techniques of identifying various syndromes of prejudice, they offer some suggestive conclusions. Rational arguments, they say, cannot be expected to have deep or lasting effects upon a phenomenon such as social discrimination which is essentially irrational. Appeals to sympathy for the plight of minority groups may do as much harm as good when directed to people one of whose deepest fears is that they might be identified with weakness or suffering. Urging closer association with members of minority groups will be futile in influencing people who are so built that they cannot experience relations with others. And establishing liking for minority groups is next to impossible for people who are really unable to like anyone, including themselves. Of some importance for us is their final conclusion that no lasting increase in people's capacity to see and be themselves can be expected from manipulative devices. In other words, they say, the devices of salesmanship won't work to make people less authoritarian.

Other examples could be provided but they would unduly extend the present paper. I cannot refrain from mentioning, however, the possibility that empirical studies might be framed which would test the hypotheses advanced by Harold A. Innis (5), that cultures exist in space and time; that media of communication confer monopolies or oligopolies on the knowledge which gives being to cultures.[1]

The main point to be made here is that the way may now be open for integration of the content of the social sciences as it bears on the process of communication. If this hope is justified then we may expect to find the "quantifiers" endeavoring to measure variables

[1] See especially his paper, "A Plea for Time," pp. 61-91.

constructed on hypotheses previously not admitted to the laboratory situation. Also one might hope that the results of rigorous logic and observation pursued *outside* the laboratory might in this area acquire status as intellectually valid "evidence."

II

At this point I should like to sketch one "non-scientistic" approach to the social science of communications. The following remarks are intended to make a methodological point and a substantive one. The methodological point is that new and stimulating insights may be revealed by admitting institutional observations as evidence. The substantive thesis is that such an historical view as follows suggests that as our culture has developed it has built into itself increasing concentrations of authority and nowhere is this more evident than in our communications activities. The reader will observe that the substantive fruit of this methodological approach has normative implications which raises a final topic for consideration.

I would begin by reformulating the issue of the "effects of the mass media" in terms of the "effects of the kind of communications used before the mass media came into existence".[1] The kinds of services which we must look for in the pre-mass media era will be entertainment (principally), and information and orientation (interpretation of experience).

How did mankind get its entertainment, its information and its orientation before the electronic age? Before the age of the film? Before the age of the printing press? What functions were performed by these services as thus rendered?

We might begin with the Middle Ages. In that period, most of the entertainment in the form of fiction (stories, folk tales, etc.) which was available to children was what they heard from senior members of their own families. The children's unsophisticated reactions of alarm or pleasure at the tales they heard might encourage the story-teller to soften or expand the story as it developed. As far as specialized entertainment services were concerned, adults depended on ballad singers, minstrels, jesters and groups of actors. From them they heard the folk tales, fairy tales, morality stories, and so forth which constituted the non-clerical forms of entertainment. The pageantry of church and community ceremonies also had its entertaining aspects. As Pellizzi (10) has pointed out the entertainment was primarily ritualistic in character.

[1] In this portion of the present article I am profoundly indebted to David Riesman, author of *The Lonely Crowd* (11). Standing back of him in this respect are Max Weber and the historians, sociologists and economists who developed some of Weber's ideas.

News and other information was similarly transmitted through face-to-face communications in feudal Europe. The market place, the inn, provided the location. Travelers, merchants, seamen, soldiers, etc. transmitted news to the general public in this way, while for the nobility and clergy special couriers brought information in person.

For the bulk of the population which had no formal schooling available to it, the main source of orientation was conversation—conversation between parents and children, between children, between men at the bench or at the pump or tavern, between women at their washing. For the church-goer, for the member of a medieval guild, for the merchant, and for the noble, appropriate institutional orientation was provided by religious, occupational or political organizations.

In looking back, we are struck with the extent to which the medieval man's communications in-take was *traditionally* directed. Custom, superstitious and irrational though it might be, ruled his individual life and conditioned the content of his communications. You might say that the medieval man internalized at his parents' side the traditions which he then used to direct his life.

Apart from its tradition-directed content, communications in the Middle Ages had one other very significant characteristic: they were face to face. There was ample opportunity for what today is called "feedback." (What the communicator receives back from his audience is feedback.) The listener registered pleasure, boredom, skepticism, excitement, blunt disbelief, or some other reaction to what he heard. The communicator—whether story-telling grandpa, the court jester, the newly-returned veteran of the Crusades, or the traveling troupe of actors—could *see* and *feel* and *hear* the emotional response of his audience. On the basis of this feedback, he could and usually would modify his content if necessary in order to achieve the desired effect on later renditions. From the listeners' viewpoint, this interplay permitted direct—even intimate—"controls" on the communicator. His performance was subject to immediate review. His responsibility was personal, direct, and unshiftable.

The personal nature of medieval communications had still another implication. The success of the communicator depended in large measure on his skill and his personality. He was an individual, not a corporation. His policy was made under his own hat, not in an air-conditioned Board room by Board members mostly unskilled in the art of communication. Under these conditions the style of delineation of the characters, the story-line, the news report, and the interpretation was free and fluid.

Our second snap-shot view of communications history begins

with the age of the Reformation, the rise of national states in Western Europe, and of the Commercial Revolution in economic life. It ends during the 19th Century. This one covers about 500 years. It was the era of the growth of modern capitalism. It includes the period of the Industrial Revolution, and the pioneering growth of American life down to the disappearance of the frontier. Progress was in the air. The Church and the nobility remained powerful forces in the new national states for most of this period. And tradition and status still were influential, especially among rural and working folk.

A new character type—the inner-directed character—came into being with the rise of Protestantism. Protestantism supplied the religious justification for the rising business class. It held with Calvin and Luther that business was not necessarily a sinful affair. For the individual, Protestantism meant that his conscience was more important than it had been under the traditional Roman Catholic system of the Middle Ages. It was as if, as Riesman says, he had swallowed a gyroscope. His conscience, like a gyroscope, kept him on course. The course was one which avoided the pitfalls of sin and waste in pursuit of material success here on earth and salvation in the hereafter. This inner-directed character system was diffused through the business community and from it to the population at large with the aid of the printing press.

The entertainment function of communications in early modern times was carried on by the successors of the medieval entertainers on the stage and in community ceremonies of one kind or another. The medieval function of the parents as story-tellers to the children was continued, but the content of the stories shifted somewhat to introduce inner-directed themes. With the printing press came books, newspapers, and the predecessors of our magazines. Increasingly these media assumed the function of providing information and orientation. *Communications began to be mechanized, began to be a business.* To this extent communications lost their personal, face-to-face nature. Now if the story-teller's readers threw his book into the fireplace in disgust, he didn't know it. There was no direct feedback. The readers had lost their direct control over those who spoke to them through the medium of the printing press. The market came between communicator and reader. Moreover, with the market for publications came the alienation of the creative writers from the policy-making of the press. Editors began to make policy on the selection of books and information for their newspapers—in line with the business appraisal of the market. Writers became specialists in writing in contrast to the full-functioned creative story-tellers of medieval times. The style of entertainment in the inner-directed era was unique and appropriate to its *Weltanschauung*. One can al-

most take it as axiomatic that with a decrease in possible feedback there goes a proportionate decrease in the humanity of communications. I mean by humanity all of the kaleidoscopic diversity of human elements of strength and weakness, humor, pathos, spontaneity, candor, imagination and originality.

Though *direct* feedback was lost with the advent of commercial publishing, the market did provide one partly compensatory indirect control to the readers. New talents could enter the market easily. If a new writer didn't like the best deal he could get from an established publisher, he could find his own printer and publish his own work. Or, he could even start his own printshop and do the whole thing himself. It was relatively easy and inexpensive.

Up to the latter fourth of the past century in the Western world there was predominantly face-to-face communication. An enlarged school system, the Chatauqua circuit, the orators so popular 100 years ago, the family fireside where stories were told and retold, the legitimate stage for big and small cities, the early chambers of commerce, the early labor unions—all of these were the principal means of communication as recently as 75 years ago.

Our third historical snapshot covers less time than either of the first two. It is the era beginning in the last quarter of the 19th century. In it the scope of the business operation of our entertainment rituals has widened to include virtually all attention given to drama and music through the agency of the mass media.

This era was ushered in when as a result of the developments in our technology, productive capacity "caught up" with the capacity of the bulk of the population to buy the fruits of their labor. From that time on our system was capable of producing more goods and services than could easily be sold at the producers' desired prices. This led to the rapid growth of advertising and other methods of manipulating the customer into buying things. The disappearance of the old-style small businessman and the predominance of large-scale business organization has shifted the center of gravity of our population into white collar jobs. Along with this shift has, of course, gone the increase in urbanization. This concentration of population in cities necessarily has increased the dependence people feel toward others.

Deference to the presumed value standards of others is at the root of the character structure which is growing to be typical of the marketing era. Such standards tend to displace the conscience and tradition as the guide. "Other-direction" is the essence of the appeals of advertising and salesmanship. The method of character operation here may be likened to the radar. It is as if the other-directed person had swallowed a radar in his childhood, by which he guides himself according to the real or fancied standards of his peer-groups, the latter usually scaled somewhat ethnocentrically. The

agencies of mass communications both facilitate and themselves create these standards.

As the army of white collar employees has grown, business and government have mechanized their duties and rationalized their operations. As Mills (9) puts it, the "managerial demiurge" sets up an impersonal "system" which manipulates the population to the presumed advantage of the organizations, but without personalization of responsibility. For those who head the organizations, as for the remainder of the "other-directeds," virtue comes no longer to be its own reward; rather policies are justified in terms of their results in meeting group-determined objectives. Group loyalties are exalted above conscience and tradition.

The procedures involved in training for the new outlook on life and business become pervasive. Personality tends to replace skill as a requirement for hiring and promotion. What began as an attempt to prepare employees for successful business has been diffused as a way of life. As Mills says rather bitterly, there is a public relations aspect to private relations of all sorts, including even relations with oneself.

> Without common values and mutual trust, the cash nexus that links one man to another in transient contact has been made subtle in a dozen ways and made to bite deeper into all areas of life and relations. People are required by the salesman ethic and convention to pretend interest in others in order to manipulate them. In the course of time, and as this ethic spreads, it is got onto. Still it is conformed to as part of one's job and one's style of life, but now with a winking eye, for one knows that manipulation is inherent in every human contact. Men are estranged from one another as each secretly tries to make an instrument of the other, and in time a full circle is made: one makes an instrument of himself, and is estranged for it also. (9)

The mass media now supply entertainment which more than fills the quantitative void left by the displacement of the older rituals for entertainment. As far as information is concerned, radio and TV have completed the attenuation of face-to-face communication begun by newspapers, magazines and books. The role of the family in interpreting information has also shrunken. Children, no less than their parents now depend on radio, TV, and publications for direct orientation on public affairs. More subtly, the comic books, the pulps, the movies, plus radio and TV provide in fictional form the behavior patterns which imply orientation towards public—and private affairs.

What becomes of feedback from the audience to the communicator under these conditions? Direct feedback is shrunken to the small volume of fan mail. Indirectly a sort of feedback is supplied by pressures exerted for "codes" of ethics in the operation of the mass media. Being administered by the same groups to which they apply, these codes are inherently weak and unenforceable except through the operation of conscience.

The economic open-endedness of the publishing industry which was a partial corrective for the loss of feedback until late in the 19th Century has now virtually disappeared as a characteristic of the mass media. The huge capital sums required to start a successful newspaper, TV station, or motion picture production effectively exclude fresh and experimental ventures to the point where their occasional appearance is regarded as a "curiosity." The banker's approval, necessary to the loans required for investment in the complex technical equipment of our day depends on offering something *safe*—that is *like* what the existing mass media already sell. Patent restrictions also bar easy entry. And in the radio and television fields, the shortage of spectrum space limits the numbers of stations. On the whole the possibility of effective feedback to the men who run our mass media is negligible today. They are in effect autonomous—irresponsible, except through their own consciences, to the viewer, reader, or listener.

The style of writing and production used in our mass media is in keeping with the ethical and aesthetic values of other-direction. Riesman, in *The Lonely Crowd,* finds stereotyping characteristic of our mass media. Invulnerable authority symbols appear as stereotypes in most entertainment offered the young. In our current entertainment the hero wins so quickly that it cannot help but seem effortless. In the process neither the hero nor the listener has time to experience internal moral conflict (as in the inner-directed story), nor the desirability on occasion of asserting his individual goals in the face of hostile authority (as in the tradition-directed story).

There is a stereotyped tightness of fit in portraying the physical externals of the characters on our mass media. Details of speech and costume are carefully filled in. Typecasting with faithful repetition of familiar mannerisms is essential in order that the picture, article or program may be distinguishable from their competitors. Exceptions to this style are most often to be found in book publishing, occasionally in magazines, rarely in the other media.

Still another aspect of stereotyping in the mass media comes from the assumption on the part of the advertisers that the fictitious mass audience wants more of the same sort of programs currently available. Thus we find slavish imitativeness in the multiplication of a few types of entertainment programs. This fallacy parades under the label of "giving the public what it wants (as determined by Hooper-ratings, and the like)," and has even been glorified by the president of Columbia Broadcasting System as "cultural democracy." Obviously the public cannot vote for what it has never experienced.

If the foregoing analysis has any validity, the hypothetical conclusion might be drawn that as our social organization has become more tightly integrated on the basis of modern technology, authority has increasingly been built into it. To be tested is the further

hypothesis that our mass media, through cutting off feedback, through dealing in stereotypes, through specializing in a manipulative view of humanity (both directly through advertising and indirectly through the plot structures and motivations portrayed in entertainment and other program material) are capable of moulding us more and more into authoritarianism. Such a conclusion is translatable into terms of a general theory of communication—provided all parts of it are not required to be demonstrated in controlled experiments simultaneously and immediately. An adequate general theory has yet to be fully developed. Perhaps a beginning lies in a theoretical model currently being developed by my colleague, Professor Charles E. Osgood. This model, as yet unpublished, conceives of the communications field as consisting of communicating units (individuals and social institutions) simultaneously functioning in all stages of the communications process. These stages are regarded as the *receiving* of information, the *interpreting* of received information, and the *transmitting* of information to other units. Account has also to be taken of "noise" [in the sense employed by Shannon (12)], and "feedback."

Having identified the normative aspects of both the "scientistic" approach and an alternative one, a final word is necessary concerning the ethical value issues involved in the *application* of communications research techniques. In the United States there have been numerous expressions of concern on this score. For example, one of the leading scholars in this field, Dr. Robert K. Merton says, "The technicians of mass opinion cannot escape the moral issues which permeate propaganda as a means of social control the pressure of immediate objective tends . to exact a price of the prevailing morality for it expresses a manipulative attitude toward men and society."[1] A foremost economist in North America, Dr. Harold A. Innis, is heard to say:

> The political realization of democracy invariably encourages the hypnotist. The behavioristic and psychological tester have their way. In the words of one of them: "Great will be our good fortune if the lesson in human engineering which the war has taught us is carried over, directly and effectively, into our civil institutions and activities." (C. S. Yoakum) Such tactlessness and offence to our good sense is becoming a professional hazard to psychologists. (5: 90)

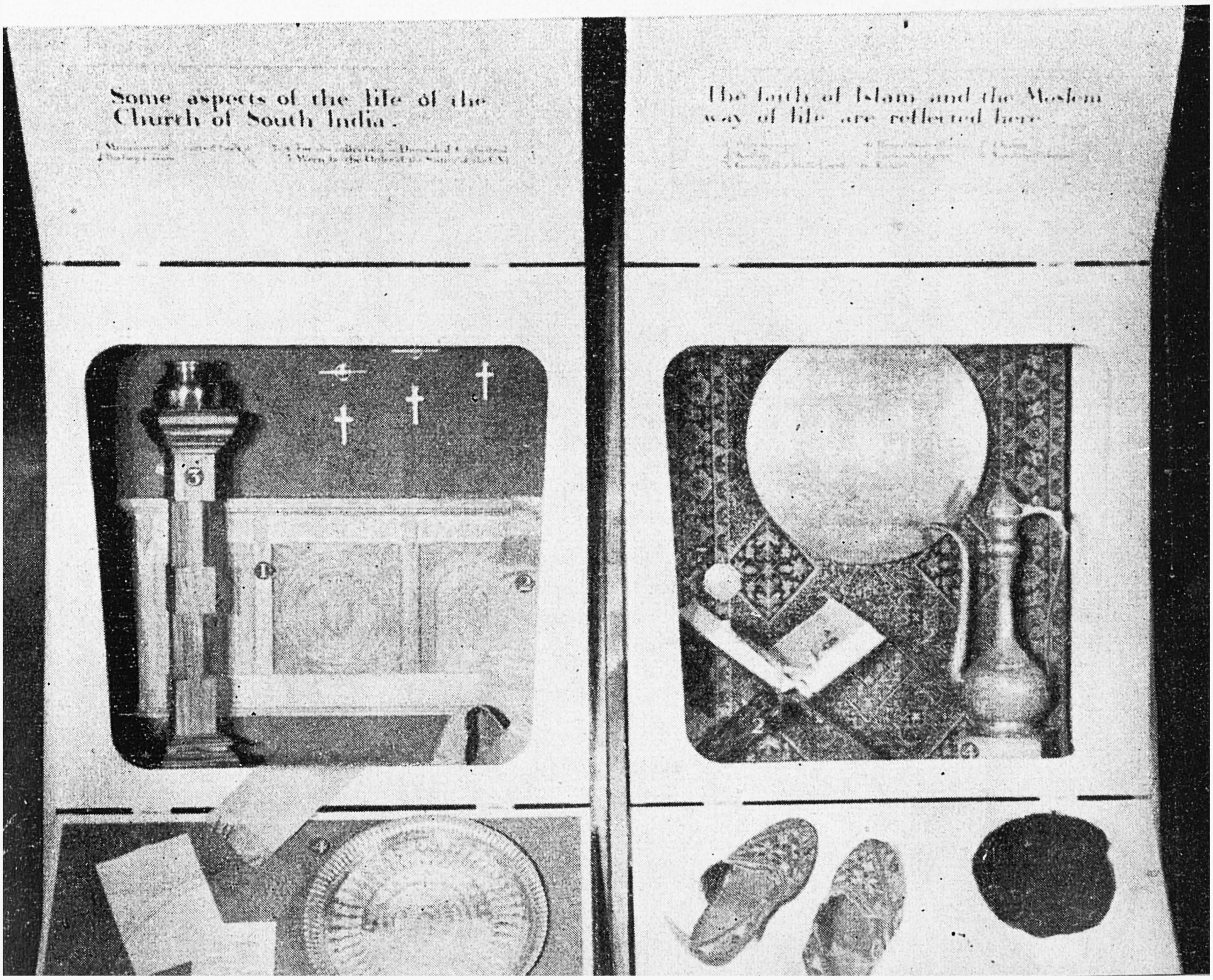
The quotations could be multiplied. Quite recently, Mr. William H. Whyte, Associate Editor of *Fortune* magazine, in his *Is Anybody Listening?* delivered a biting attack on the social scientists who apply the techniques and theories of "social engineering" under many labels. It may be argued whether such a sweeping indictment is justified. Perhaps on balance, Mr. Whyte's view may be well taken, if the

[1] Quoted in Whyte, William H., *Is Anybody Listening?* (14: 233).

results of social science in the field of communications are to be judged solely on the basis of the use made of this material in the current scene. However, an excellent case may be made for separating the ethically self-conscious social scientists from those who practise pseudo-social science. My point here is no more and no less than to establish the proposition that a greater degree of concern with communications theory, its premises and its preconceptions, is the best safeguard communications social scientists can use to ensure the integrity of their scientific work. In the interest of the values of our cultural heritage this, it seems to me, is our ultimate obligation.

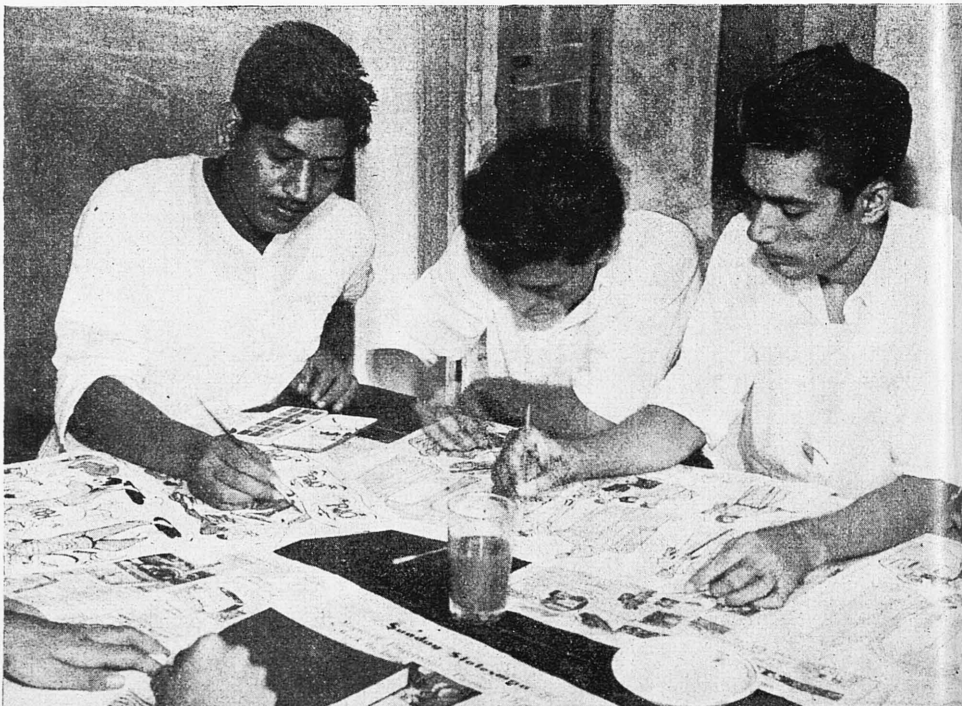
Missionary Exhibition. The Church Missionary Society, London, produced a major exhibition of 40 lighted easel type units for use in missionary education. A general view of the Exhibition.

A close-up of the South India and Persia windows.



Teachers in India making their own puppet and flannelgraph sets. This Workshop experience has much value.

Coloring "Life of Christ" flannelgraph sets at a Fatehgarh workshop.



Chapter 4

PRINCIPLES OF UTILIZATION

DONALD F. EBRIGHT[1]

A NUMBER of assumptions about audio-visual materials are sprinkled throughout this *Handbook*. These assumptions are basic to our conception of a well-organized programme of audio-visual aids. Let us take them up as follows:

1. *In developing the use of audio-visual aids, we begin where we are, make a better use of what we have and add to our materials and equipment as soon as we can.* Some people complain so loudly about their lack of a 1955 Magnetic Sound Projector that they do not hear the good news about pictures, flannelgraph, drama and lyric evangelism. We do not need Hi-Fi rigs, sound projectors, preamp tone control units or tape recorders to begin. Every teacher in India could have a basic set of flat pictures, every village worker could have a flannelgraph set, every church could have a drama group, every district could have a lyric evangelism team using indigenous *bhajans, kalakshepams, kirtans* or *kathas*—and these are potent Gospel communicating tools. Our eventual programme is incomplete without sound films, radio and filmstrips but we are not without audio-visual aids if we do not have them today.

2. *Audio-visual aids are not something separate from other methods of teaching but are a necessary part of our repertoire.* They do not replace printed books, teachers or preachers—they are aids. When the full range of audio-visual aids is used by the churches in India not less, but more, printed matter will be used. The result will be better understanding, enjoyment and appreciation. We make a mistake if we overemphasize one aid. Our aim should be to utilize a wide range of equipment and materials.

3. *Audio-visual aids must fit into the ongoing curriculum or preaching plan but not into the old, worn groove.* Out of the church and school the things we refer to as audio-visual aids are bright, interesting and colorful. Today's children are growing up amidst these qualities and expect them in their Sunday School, church

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or hostel programme. If we try to fit a few new aids into a dull curriculum or creaking programme we will not make the dull pattern brighter. It's like a seven-year old girl's comment on teachers: "I love my teacher but Betty has an awful teacher. Betty's teacher gives demerits and hits you. My teacher helps you." It's that way with audio-visual aids.

4. *Audio-visual aids are basic to teaching on all levels, not simply in the primary school.* The Wayne University color film 'The Feltboard' (flannelgraph) has aroused great interest in our institutes and workshops because it demonstrates this aid being used by all age groups including college and in many subjects. Some people still think that audio-visual aids are limited to little children. If we are to increase the effectiveness of our teaching in all areas and age groups we must use audio-visual aids all along the line. They are as effective for urban Ph.Ds. as villagers.

5. *Audio-visual aids make teaching more effective, not easier.* Filmstrips, globes and records will not teach or preach. More planning, more skill in utilization and more time in preparation are required to make use of these aids in church and school. But without them teaching lacks the effectiveness demanded by today's electronic and communication-conscious world.

6. *Our immediate task as pastors and teachers in India is not to justify the use of audio-visual aids in our church or school but to catch up with the progress of other institutions in the use of materials and equipment which have long since been justified by research and experience.* Audio-visual aids are widely used in the educational programmes of industry, military training, adult education, advertising, government information services and can be used with power and effect in religious education, evangelism and the ongoing work of our schools, hostels, churches and institutions. They require no *apology* to justify their use by the Church of Christ in India.

If we accept these assumptions then we are ready to look at our present job and ask: "How can I use audio-visual aids to do the thing I am going to do anyway?" Effective use of audio-visual aids in learning requires a skilled teacher or pastor, who will use the right aid for a particular subject or goal at the right time and in the right way. All this is bound up with a consideration of utilization. What follows is not new for the principles are those of good educational methods and I only review them.

The problem of when to use audio-visual aids introduces a new set of problems. Certainly in the beginning stages of the use of audio-visual aids it is helpful to follow a series of steps. Four major divisions of good utilization are:[1]

[1] I am indebted to Rev. R. G. Korteling for material from Chapter III "How to Use Audio-Visual Aids", pages 14-20, in the first *Audio-Visual Handbook for India.*

Preparation Presentation Application Follow up

Preparation comes first and grows out of a careful formulation of our purpose. If our lesson unit was "God's Love" we could approach it from several angles based on varied portions of Scripture. The type of audience, age level and teaching situation must be considered. The religious background of the group must be evaluated just as did Jesus in his conversations at night with Nicodemus. Our choice after considering these factors may be to teach the lesson of 'God's Love' as He Himself did, by using the parable of the Prodigal Son.

PREPARATION

There are many things a leader can do to prepare himself. Some of these are:

Preparation: Review Goal Select Material Plan Lesson Place Order Rehearse Check Yourself

We begin by reviewing our goal, (i.e., what is to be done: objectives). Why are we teaching this lesson, preaching this sermon, visiting this village or addressing the Mothers' Union? Let us write it down and have it clear. Our goal established we proceed to select the materials we need.

Each audio-visual aid has its advantages and limitations so we must know our tools. Select the most effective aid:

(*a*) *Blackboard.* For sketches, diagrams, outlines, definitions and assignments.

(*b*) *Posters, Cartoons.* To arouse interest, attract attention, inspire.

(*c*) *Books, Pamphlets.* To introduce an idea, for standard information and background material.

(*d*) *Samples, Models.* To show the real thing in manageable form. Make large operations visible.

(*e*) *Motion Pictures.* When an over-all view or impression is needed. When it is safer to get the information from a film. To bring the past to the present.

(*f*) *Filmstrips, Slides.* When motion is not necessary. When learners would profit by a special pace. Superior for many situations in India.

(*g*) *Opaque Projection.* When the class would benefit from the same map or drawing at the same time and the teacher wants to focus attention on a specific point at one time.

(*h*) *Field Trips.* Orient students, correlate with other studies and introduce new ideas.

(*i*) *Flat Picture.* Have been used as a center of attention in a worship service and as aids in class-room teaching. Best for small groups.

(*j*) *Amplifier, Turntable, Records.* To lift your voice against village-noise competition, for commentary on records, music background and teaching congregational singing.

(*k*) *Drama.* Major method of expression through plays, puppetry, socio-drama and role-playing.

(*l*) *Flannelgraph.* One of the simplest yet most effective aids. It builds up pictures as the story develops and thus provides a visual image of the people and places referred to.

There is generally *one* method that best fits the presentation to be made or sometimes a combination of methods are needed. But before using any aid we should know *why* we have chosen it. A clear purpose must undergird our work. Why use this *recording?* "Our Village Christians are not singing heartily so the Muttra Choir record will set a good example." "Why use this *model?*" "My Sunday School class asked, 'What type of house did Jesus live in?' " "Why this *film?*" "Our unit of study is on Discipleship so we are using a *Family* Film entitled, "Jesus and His First Disciples". "Why have you chosen this *filmstrip?*" "Our lesson unit is, 'God's Love' ", so we are using a filmstrip produced in Jabalpur entitled, "The Prodigal Son," for next Sunday's lesson. Since it is filmed in India against an indigenous background it will make a strong appeal to my hostel group. Since there can be a choice we learn to choose a specific audio-visual aid to do our job of communication—sharing ideas and facts—the best we can.

Having reviewed the goal and selected the right aid we plan the lesson or service. If it is a worship service we plan every step from Call to Worship to the Benediction. How will you proceed logically and emotionally to reach your goal in this presentation?

Our next step is to secure the material or equipment we need. Since we are projecting "The Prodigal Son", we can borrow it from a denominational library, buy it from one of the two N.C.C. A-VA Sales Depots or rent it from one of the two N.C.C. Film Libraries (See

pp. 200-201). Register at the nearest library, learn the rules and order well ahead of time if you plan to use material from Allahabad or Arogyavaran.

Rehearse or preview is a timely suggestion. Practise using the *flat picture* in the picture frame. Rehearse the *flannelgraph* story. Play through the *record*. Project the *filmstrip* "Prodigal Son" and know its contents frame by frame. You cannot talk effectively about what you have not seen. More than one embarrassing moment has arisen because of the failure to rehearse, practise or preview. In doing this you can decide what you wish to call attention to and what you want to delete.

Then consider the place: Village courtyard, church sanctuary, *mango* grove, hospital waiting room or classroom? The leader must think of the specific lesson, utilizing specific aids in a specific place. Will the place be cleaned or must that be arranged? What about seating: on the floor or chairs? Electric current, gas-electric generator, battery, Coleman lamp or candles? Are they ready? If flannelgraph in the grove there is too much ventilation; but if a filmstrip in a village house there will not be adequate ventilation. How to minimize distractions for every time you compete with a disturbance you lose a bit of your audience-reaction and the good recedes.

There are props to consider. Where shall I hang the chart? Who will check the projector? Is there a table for the flannelgraph figures. The *kirtan* band will want a rug and a low table. We must have branches for Scene III of the Puppet play. Will I need a screen for "The Prodigal Son" or is there a whitewashed wall?

Someone has said that before each lesson the leader must check himself. A village pastor was demoted because he rode to a village and conducted Holy Eucharist with his black bicycle-clips showing on his trousers below the vestments. A District Superintendent arrives at a village church on Sunday morning at church-time and finds the padre unshaved. Here are minor points on which we can check ourselves:

SMILE—It is good equipment
ENTHUSIASM—It catches
EYES FORWARD—They get attention
VOICE—Change pace to keep audience awake
PARTICIPATION—People love it
BE LOGICAL—Follow your order of service or lesson plan
DRAMATIZE—Do not be afraid of great showmanship.
Remember Billy Graham

Abraham Lincoln said, "Be sincere be simple be seated". Let's learn how and when to end our service. Audio-visual users might well add:

Be Yourself
Be Prepared
Be Enthusiastic
Be Clear
Be Spirit Filled
Be Expectant

PRESENTATION

The goal has been chosen, preparations have been made and the presentation follows. Here are some factors to be watched:

Presentation:
Introduction
Create Attention
State Purpose
Present Material
Project Again if Necessary

Of course your introduction and method of arousing group interest will vary with the setting: devotional in a church, entertaining in a social, or instructional in the classroom. But whatever the setting the few selected words that will set ears atune, hearts afire and eyes waiting to see do not come by chance. Humour, a striking observance, dramatic illustrations, anecdotes, music or a call to worship may be the way to reach the group. Remember the audience is more interested in your presentation than your talk about your presentation. They need to know: (1) What the filmstrip will show. (2) Why it is being shown? (3) What the audience is expected to get out of it? State the purpose of the meeting, relate it to a previous meeting if applicable and then go on with the presentation:

(1) Present your material: in this case a filmstrip.

(2) Stress important points.

(3) Do not wander from the theme, "God's Love", to bring in sub-plots.

(4) Introduce supplementary audio-visual aids, in this case a poster of the "Prodigal Son" and 2" x 3" flat pictures for free distribution to the children.

(5) Keep the language simple and realistic, i.e., avoid verbalism.

(6) Strive for a high standard of performance.

It is often helpful to project a filmstrip or film a second time. This is especially true in the classroom. At the proper stage of

post-projection class discussion the teacher may ask, "Would you like to see the picture again and notice the points you have raised?" Generally more is observed the second screening than the first. This method is best for small controlled groups and is not as effective in general programmes, fairs and *melas*.

APPLICATION

"No teaching is complete without application to life" wrote R. G. Korteling, and "no preaching attains its end that does not change the souls of men" In the classroom we would say that no one learns unless he is allowed to apply, practise and assimilate what he is being taught. Application may be of several types:

Application:
Practice
Questions
Examination
Discussion

The Wayne University film, "The Feltboard" is most effective when it precedes a flannelgraph-workshop where students have access to cloth, scissors, coloring material, glue, etc., and can prepare their own set of figures. The presentation of any "know-how" material should be followed by practice, construction or other directed activity.

Some subjects produce questions. Let us learn to ask questions and get answers. Questions are a part of the application-assimilation step. Sometimes it is not easy to get a return from a group. Sometimes the question is not understood. Village groups may find it hard to organize their thinking and put it into verbal symbols.

Other subjects lead to an examination or testing. After seeing one of the series of films entitled "Two Thousand Years Ago", the teacher can ask questions or set a written or oral test. This helps to establish important facts in the mind while the impression is still fresh. Many business concerns use true and false checklists after showing instructional films.

Many visual aids lead to a discussion as, for example, social-problem films which start a group thinking on changes in their community.

All of these are ways to apply what has been seen, heard and handled. These are as effective for religious situations as a factory training class. Bible lessons can be presented with the use of audio-visual aids and the amount of learning checked by these suggestions. The use of the N.C.C. A-VA Stewardship posters should lead to

increased giving by the congregation. Every stimulus must lead to a proper reaction. Every effort we make should bear fruit in due course.

AGAIN, AGAIN AND AGAIN

Is this the end of our presentation? Not at all. Think for a moment of the daily newspaper, the radio and cinema. Why are these media of communication so powerful? One answer is that of repetition. If a person reads a daily paper once a month, listens to the radio on holidays and sees a movie twice a year we need not fear they will influence his life to any great degree. It is because of the daily impact of press, radio and cinema that these are powerful tools.

Let us carry this into our work and repeat the message we would communicate. An institute was held in Udgir in August, 1954, in which the theme was "The Transformed Life" based on the life of Zachaeus. The boy's school presented a play, the *kirtan* band sang, a club produced a puppet play, a filmstrip was shown, a flannelgraph set was produced and a Hindi sound film was screened —all with one subject, "The Transformed Life" as seen in the conversion of Zachaeus the tax collector. The purpose of this institute was to demonstrate that one idea could be communicated by various media in India. This multi-impact approach of "again, again and again" will help us in the task of changing attitudes, acquiring facts and re-orienting lives.

FOLLOW-UP

After the presentation you may pack up the flannelgraph, rewind the film and sort out the slides. But is this the end? It should be a new beginning. We can follow-up in various ways.

Follow-up:
- Reading
- Writing
- Dramatization
- Field Trip
- Organization

For those who can read a world of new ideas unfolds after the programme. School children can combine reading and writing to deepen the impact of a visual aid. The film "The Transformed life" may lead a youth group to produce a play. A film on "Rural India" may lead a city church to send their Sunday School to visit a village congregation.

In our evangelistic work there are so many ways to follow-up our presentation. Meditation, prayer or an altar call follow many an audio-visual programme. Consider the closing scene of the film, "Barabbas the Robber", with Barabbas looking up at the crucified Christ. He says, "He died for me, He took my place, now I must live for Him." After this scene what is more natural than for the evangelist or pastor to lead the congregation into a period of personal dedication and consecration where everyone identifies himself with Barabbas: "He died for me, He took my place, now I must live for Him" Used correctly a film can be a channel through which the Holy Spirit can work to redeem and transform.

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Chapter 5

ORGANIZATION FOR EFFECTIVE USE

K. K. GEORGE[1]

ORGANIZATION is the key to effectiveness. All over India one can see sporadic and unorganized attempts by the Church to use audio-visual aids. Better planning and organization is essential if audio-visual resources are to be really effective. It is high time for Christian leaders to recognize this need. Non-Christian forces are already exploiting every means of mass communication to their advantage. In a predominantly illiterate country like India audio-visual education is a far more effective means of communication than any other. In such a nation the cinema will influence more people than even the press. To a great extent this accounts for the fact that India ranks second in the world for film production. The cinema has moved into every remote nook and corner and the masses are becoming movie-minded. Should not the Church take cognizance of what is happening? It is a challenge to the Church to harness the most powerful means of communication for the propagation of the gospel, and also to organize the effort.

The Audio-Visual Aids (A-VA) Committee of the National Christian Council of India is endeavouring to meet this need. The fourteen Regional Christian Councils have appointed similar committees with a view to increase the use and production of these aids and are rendering valuable service. However, they have their limitations. The relation between these committees and the churches is not yet sufficiently vital. They will have to develop deeper organic links with the churches if they are to be sources of real inspiration. Only such an organization which is of the Church, from the Church, and by the Church can be expected to move the Church and keep it moving.

It will be advisable to have an A-VA Committee for every church. It should be made up of competent and interested persons and should be representative of various interests and institutions such as Worship, Evangelism, Sunday School, Youth Work, Women's

[1] Rev. K. K. George, Th.D., Tiruvella, South India, General Secretary of the Mar Thoma Sunday School Samajam, is Chairman of the Kerala Regional Christian Council Audio-Visual Aids Committee.

Work, etc. An active committee will draw the attention of the Church and stir up activity in many quarters. It should study local audio-visual needs and create the necessary organization. This committee should: (1) preview material; (2) promote these aids; (3) formulate a budget; and train leaders. Such a committee would be a source of information on available materials as well as their use. It would adopt a programme to educate the church in the meaning and use of these modern tools. It would recommend to the appropriate bodies the steps which need to be taken for properly equipping the Church. This means that the committee would be familiar with all the available resources. It would secure the latest catalogues of religious and educational organizations, catalogues of commercial distributors, information services of various countries in India, as well as the Government of India's Information Department. It should set up conferences, institutes and workshops for training in the audio-visual field.

The committee will need to exercise caution in its programme. The introduction of A-VA Aids in the local Church should be gradual. A sudden burst of enthusiasm may be fraught with several dangers. The entire programme may be looked upon as a fad sponsored by a few over-enthusiastic folk. In some places it is even likely that opposition to the use of motion pictures among conservative sections may provoke unnecessary trouble. Also Audio-Visual education may tend to separate itself from the programme already under way in the Church.

A-VA enthusiasts should not ignore the fact that some sincere people have grave fears about the use of films. Such fear provokes them to oppose the use of any type of film in or by the Church. Their reasons may seem odd. But the fact that such conservative people exist all over the world including the most civilized countries should not be forgotten. Only a few years ago an American Missionary speaking to a simple village congregation in South India opened a tirade against the use of the motion pictures. Mustering an array of arguments to prove "the depravity of the movie" he began expounding the meaning of the word. "Cinema", he said, "is the combination of two words, 'Sin' plus 'Ma' which is to mean the 'Mother of Sin' " Though this might look like the result of ignorance plus bigotry to us, to that simple crowd it sounded convincing that the Cinema was of the Devil. ("Cinema" is of Latin origin and means that which moves.) Opposition has to be dealt with prudently. Slow infiltration is a possible measure. Try to find out the special interests of the opposition. They may be interested in missionary education, or the Sunday School or some other branch of activity. The best way is to infiltrate visual materials and methods into their programme. Good filmstrips and motion pictures that will help the cause in which they are actively interested may be used with effectiveness. Help

them to succeed and let them enjoy the credit. Soon their opposition to A-V Aids will begin to vanish. Often understanding and co-operation will perform what fighting cannot.

Another method is to use the best materials for demonstration purposes. Show people examples of the best visual aids and how they are used. Very often a well-presented programme will have such an appeal that opponents become supporters. The author has used the Moody Bible Institute films and the "King of Kings" in many centers and discovered that "those who came to scoff remained to pray".

Audio-Visual education should not separate itself from the on-going programme of the Church. Audio-Visual aids are a means and not ends. It is a mistake to conceive of visual education as a programme in itself. As W. L. Rogers of the Religious Film Association has remarked:

"Fundamentally the Church has—or should have—a programme. It is a programme built at the denominational headquarters and in part by the local minister and his leaders. To make the programme effective it will be desirable to use visual aids, but only such aids as will forward the programme. When visual aids cease to become aids and become the programme, something is vitally wrong."[1]

Proper use of visual aids will relate them to the entire programme of the church. Visual aids ought to aim at reinforcing the programme adopted by the Church. This necessitates co-operation with other agencies which are working in and for the Church. The A-VA committees should study the existing programme and discover how visualization can make it more effective. The leaders in these agencies will have to be convinced of the importance and usefulness of visual aids. It will be better if they actually learn how to use these aids. This will require a programme in leadership education.

It will be helpful if the A-VA Committee calls together leaders of the various agencies in the Church and plans for the visual aids necessary for the year. In consultation with them the occasions when films and filmstrips will be shown should be listed. A description of the content and the message should be given to enable the leaders of other agencies to integrate the visual-aid programme with their own activities. Such planning will also help various groups to benefit by the same programme.

A-VA Committees should avail every opportunity to co-operate with non-Church bodies which are engaged in helpful activities. There are many agencies that have addressed themselves to the great task of national reconstruction. Where there is common interest let us join hands with all who work for good. Such activities will also help to win the good will and confidence of the non-Christian

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[1] W. S. Hockman, *Projected Visual Aids*, p. 158.

community. However, enthusiasm for such service should never carry us away from our primary aim of evangelism.

Intelligent co-operation with civic bodies can be of considerable help in the propagation of the Gospel. The author remembers an impressive experience he had in an exhibition arranged in a town in South India by Hindu authorities. In that exhibition there was one booth named "King of Kings" A resourceful Christian artist had arrayed in this booth various scenes in the life of Christ from the manger to the death on the Cross. Each scene consisted of figures carved from wood and beautifully painted. In various scenes the figures moved rhythmically—being managed by electric devices. Thus there was the boy Jesus helping Joseph continually working the carpenter's tool. There were many other scenes that had a magical charm about them. As one walked about the booth, one was impressed with a profound solemnity which reached the climax while looking at the figure on the cross. Vast numbers of people visited that booth and all were deeply touched. Every one who came for the exhibition went in to see the "King of Kings" though admission was restricted by special tickets. Here was preaching with real appeal and people paid for it. A-VA "preached" for days on end where no preacher could enter!

The Church should awake and organize its efforts in using this a powerful medium. Every local Church should have a committee that will plan a comprehensive programme. These local committees should be guided and advised by committees on a denominational level, consisting of experts. The denominational committees should be linked with the provincial committees which are already connected with the A-VA Committee of the National Christian Council. The latter has been organized in India through the effort of RAVEMCCO (Radio, Visual Education, and Mass Communication Committee) of the Division of Foreign Missions of the National Council of Churches of Christ in the United States of America.

"RAVEMCCO exists to help the Church to send the Christian Gospel more speedily to more people than ever before. Working through the National Christian Councils of Churches, RAVEMCCO seeks to provide tools for the task of the mass communication of the Gospel."[1]

With more efficient organization the Gospel could be preached to the countless millions who are yet unreached. But let us not forget that organization is only a tool for the Master and a channel for the Spirit. It is for the Church to see that the tools are sharpened and the channel opened.

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[1] "Audio-Visual News", 1954, p.

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Chapter 6

TRAINING PEOPLE TO USE AUDIO-VISUAL AIDS

GABRIEL SUNDARAM[1]

TO train village teachers, Bible women and rural voluntary lay workers to teach more effectively, it may be wise to look in the village for more effective methods. There we find that religious education is given by carving Hanuman on a stone, painting him with a bright red colour, and leaving him on a road side. Or two cobras may be carved on a stone, and placed under a sacred tree. In worship, good use is made of lights, flowers, incense and the posture of the leader. The carvings on temples are also visual aids. While these are found in every local shrine or temple, they reach their climax in the ancient frescoes of Ajanta and the sculptures of Ellora, which have been an inspiration for centuries.

In order to do his work more thoroughly, the village teacher must look for aids which he can secure easily. He can teach by word of mouth, but he knows that if he can teach by the eye, he can do his work 30% faster, and the information is 50% more permanent. It is for this reason that people say, "I remember your face".

The blackboard is an ancient and valuable aid for teaching. Once you get it, it is always there, and saves much time for the teacher. It can be used to teach many phases of a given subject, or to instruct in many subjects, and should be used frequently.

Pictures are another important aid. They make teaching simple and enable students to grasp the ideas clearly. The Lucknow Publishing House and the Christian Literature Society, Madras, sell many beautiful pictures at a small cost. "The Times of India" and other magazines, Indian and Foreign, have good pictures, which if cut and catalogued, can be used to a great advantage. Skilful teachers have collected advertisements in newspapers and made good use of them in teaching.

Sand tables, whether placed on a table or fixed in the corner of a class room, have made lessons more realistic and enabled teachers

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[1] Rev. Gabriel Sundaram, Hyderabad, Deccan, Chairman of the Audio-Visual Committee of the N.C.C. of India, is Executive Secretary, Council of Christian Education, Methodist Church in Southern Asia.

and pupils to exercise imagination and depict their lessons clearly. The Christmas story becomes more meaningful when it is shown on a sand table.

Maps, posters, objects, the bulletin board, all bring greater understanding to the class room. A study of the village life shows that drama and puppets are ancient methods of entertainment and instruction. Herein is the key to instruction, that there is much fun in acting a drama, or securing an "Object", or framing a picture, and while students are enjoying, they are also learning a great deal.

HOW TO TEACH TEACHERS

The alert supervisor will discover a teacher interested in getting results, and it is best to work with him and introduce to him an aid which he can use well. This aid may be an object, or a picture, a flannelgraph, or a puppet, or one of the many other simple aids. Care must be taken to help him to secure the materials he needs. It is also important to help him to practise in the use of his aid until he becomes skilful and gains confidence.

After a teacher has become skilful, the next step may be to introduce other teachers to this aid. Demonstration of this aid is helpful and may create interest in teachers. When a sufficient desire is created in them, a workshop some afternoon may be attempted. Visits to other schools where visual aids are used give inspiration.

A stage will soon come when it will be necessary to organise an Institute for village workers in audio-visual aids. Some churches hold regularly an annual summer school when refresher courses are offered. The use of audio-visual aids may be included as one of the subjects.

We have in our towns and cities a large number of pastors, teachers, medical workers and others who teach. All of them will become better teachers by a more faithful understanding and use of non-projected aids. The flannelgraph has become a commonly accepted aid. It is like a movie where scenes change from time to time. But unlike the movie, the time element is under the control of the teacher, so that he may take as much or as little time to drive home his point.

In town churches, schools and hospitals, there are men and women who can use the filmstrip and the film which are valuable aids. Help may be given to individuals who use them. Workshops organised for two to five days may give intensive training to teachers who can secure the projectors. Fortunately for us the Film Libraries in Allahabad and Punganur (Andhra State) have well-stocked film libraries on many subjects. The United States Information Service, the British Information Service and other embassies have many films suitable for our use.

LEADERSHIP TRAINING

These courses may be summarised as follows: —

1. Village level. Generally three to five days with emphasis upon non-projected aids. Lectures and demonstrations in the morning with workshops in the afternoon.

2. Refresher courses. Two weeks to a month in a school or district setting.

3. Participation in established conferences. An example is the AVA Course offered in connection with the Sunday School Training offered by the India Sunday School Union.

4. Workshop for Projectionists. Advanced training for a selected few who use mechanical aids in their AVA jobs.

5. Regional Christian Council Institutes. These bring people from different missions and churches. There is an opportunity for exchange of views, and for learning from others. In the morning, general lectures on AVA. The class is divided into groups for the afternoons, and every person chooses one workshop—the flannelgraph, flat pictures, filmstrip or film.

6. Hill Station Institutes. Combined with workshops these meet an existing need due to large gathering of Christian missionaries and workers for their vacation.

7. All India Conference. Of value every two or three years to enable AVA leaders from all parts of India to share ideas and experiences.

8. Professional Training Course. As is given in the Leonard Theological College, Jabalpur. This course is open to Matriculates, who are able to study in English, and desire to take a year for training in AVAs. The syllabus includes "Non-Projected Aids", Flannelgraph, Puppets, Filmstrips and slides, 16 mm. Films and Projectors, Christian Drama, Sound Recording and Amplification, Photography, Psychology of Mass Communication, AVA in Worship, etc. This Course aims to train for every Christian school, hospital or district an AVA helper who understands the theory and practice of AVA methods, and can develop himself into a useful leader.

THE SUPERVISORS

The fourteen regional Christian Councils have Secretaries for the AVAs and Committees to help them. These secretaries have the responsible duty of convening meetings of their committees and planning for the teaching of AVA methods. An important duty of the secretaries is to organise conferences, institutes and workshops at least once a year. After attending an institute, teachers will have to practise a great deal until they gain confidence.

Large missions and churches are greatly interested in AVA methods and have set apart leaders to promote them. Wherever

such leaders have been appointed, they are able to work in the field, and discover pictures which are good, and flannelgraphs, filmstrips and films best suited for the needs of the country.

So far the highest training for national leaders has been available only in the United Kingdom or the USA. But there are now talks that such training for leaders of Asia may best be given in Asia. India is thought to be a suitable country for such training in all branches except Radio Evangelism, which may have to be taught in Korea, Japan or the Philippines.

Those who desire to keep abreast of AVA methods must read AVA News, the official bulletin of the AVA Committee of the NCC and edited by its Executive Secretary, the Rev. Donald F. Ebright, PH.D.

EFFECTIVE TRAINING PROGRAM

In training church leaders to carry out an AVA program, care must be taken to teach them not to believe that any visual aid will do. Aids must be chosen with great care so that they may help in the teaching process. Circumstances, needs and ability determine the particular aid that is to be chosen. They must not be allowed to be skeptical and take the attitude of waiting and seeing what will happen. It is necessary that a decision should be made with regard to the use of the visual aids without loss of much time. The number of people who believe that visual aids have no place in the Church is greatly decreasing, particularly because of the way the smaller denominations have made it a means of spiritual power. There are also people who would like to use visual aids, but fear they are too complicated. They need to be shown how visual aids can be simplified.

Non-projected aids are most effectively used in village work, with children, in worship, individual study classes and other smaller groups.

Projected material are best used in large assemblies, officers' and teachers' meetings, *melas, jathras* and other large meetings. The "King of Kings" shown in *jathras* has been a source of great spiritual blessing.

Visual aids have been most valuable when the user has practised them to the point of attaining skill. This gives him confidence and enables him to carry across his message. If a leader does not take time to prepare carefully to present a flannelgraph, or a projector, he is likely to cause much disappointment. The leader must also use an appropriate visual aid of good quality. A study must be made of the past experience and needs of the viewers so that the visual aid may become meaningful to them. Care must be taken to prepare the class rooms, or hall, or the open ground so that the physical conditions for a good reception may be met.

ADMINISTRATION AND PROMOTION OF LOCAL CHURCH PROGRAM

There should be a Director of Audio-Visual Aids in each Church, another for the District and finally for the Annual Conference or Diocese. Such a person must be familiar with the total program of the Church and must be sympathetic with it. At the same time he must have a personal and vital interest in visual aids. Previous experience is not essential, but highly desirable. It is important that he should have time for this important office.

Such a Director should work as the Chairman of the AVA Committee and promote the use of visual material. To do this, he must have an elementary knowledge of material and equipment and know about the physical conditions necessary for using AVA resources. One of his chief tasks is to remove prejudice.

EQUIPMENT AND BUILDING IMPROVEMENTS

In order that projected aids may be used efficiently, care must be taken to secure the necessary equipment and improve the buildings. There must be sufficient equipment to darken the room without loss of time. The institution must own a portable screen which may be carried from room to room. It must own a lens suitable for long or short throws. Arrangements should be made so that the acoustical conditions are satisfactory for a good reception.

There is need for a trained equipment operator so that the Church equipment may receive proper care. He will assure smoother and more efficient operation of equipment. He will enable the teacher or leader to be free to concentrate on the content of material and program procedure. Because of his understanding, he will eliminate much of the danger of damaging the equipment.

The operator must have experience in operating each piece of equipment owned by the Church. He must be faithful in attendance at regular church services, so that his interest is in the total program of the church, and not merely in his machine. He must have personal interest in visual aids, because they make a great impact on the teaching program. Such a person should be freed from other church responsibilities so that he will have time for this service. It is an advantage if the operator is a young person of college age or over.

The work of the operator is to check up the equipment, set it up for use, operate it, carry it back after use and clean and oil all the machinery properly.

FINANCES

The right way is to include the cost of visual aid program in the church or school budget. This is an important service and has a legitimate claim on the finances of the institution. It will be an

inspiration if special groups or individuals who understand the values of visual aids are asked to make contributions to this service. The wrong way of securing money is to receive an offering in the service where the material is used. Such a procedure is too much like charging an admission fee.

THE TOTAL PROGRAM

In the beginning, it may have been necessary for the AVA worker to decide on his program. But as the church recognises and uses these aids, it must decide on the content of the AVA program. The Sunday school teacher must tell the AVA worker the flannelgraphs or the filmstrips that he needs. Similarly, the Committees on Christian Home, Youth Work, teachers, all will tell him just exactly what help they need. The AVA worker will become the helper of all the departments of the Church, and will aim to satisfy their needs.

There are many people who have attended AVA Institutes and have received training in these methods, but do not use them in every day work. One reason for this may be that people who were taught in school under the older methods, and have learnt AVA methods in training schools or later in life, seem to lapse easily into older methods. Preachers trained in the effective use of sermons do not gain confidence in the AVA methods, until time and experience have proved that these new methods enable them to produce greater results. Sometimes workers are discouraged because there is not an abundance of material or timely help, but this difficulty is being gradually overcome. It is not easy to change mental habits of many centuries, and ask people to use modern media. Notwithstanding these difficulties, real progress is being made in a more effective use of teaching techniques. India is demanding an education related to life, and designed to solve its many problems. It is asking for revolutionary methods of teaching and herein lies the great hope that our teachers will ask for new methods which will teach quicker and more effectively.

If there are church leaders who are indifferent to AVA methods, it is because of expense, uncertainty of results, and lack of knowledge in the use of these methods. But if AVA workers will continue their work, improve techniques and produce results, they will receive recognition. If a convention is more successful by the use of AVA methods, if a Sunday school is taught more effectively by these skills, if youth work, women's work, training of voluntary lay workers becomes more meaningful by these techniques, church leaders will recognise the value of AVA, and find the workers and finances necessary for the extension of these methods.

BASIC EQUIPMENT

No equipment should be bought until interest in training of the leaders assures its use. Money available should be carefully used

reserving a part of it for rental of material. The following things will be found of value:

1. Adequate supply of non-projected aids, maps, flat pictures, models, etc.

2. Matte screen, 70 x 70 preferable.

3. 2 x 2 projector equipment (slide and filmstrip).

4. Basic library of slides and filmstrips as needed:

   (*a*) Life of Christ: Elsie Anna Wood paintings (50 slides).

   (*b*) Life of Paul:
   Providence Lithograph Company (12 slides).
   New Cathedral Filmstrips.

   (*c*) Church History:
   Builders of the early Church—
   (Providence Lithograph Co. 12 slides).
   Story of the Christian Church (Evangelical and Reformed Church—FS).

   (*d*) Old Testament:
   In Our Image (15 slides).
   Nelson Bible Books for Small Children (FS).

   (*e*) Selected Religious Art Masterpieces:
   Margaret Tarrant Slides (for children).
   Christ and the Fine Arts.
   Sallman Paintings.

5. Sound motion picture projector.

6. Opaque Projector.

7. Microphone, tape recorder and additional materials.

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Chapter 7

AUDIO-VISUAL AIDS IN THE SUNDAY SCHOOL

V. M. KOSHY[1]

THE case for Audio-Visual Aids in Education has been made out already by the writers of various chapters. That the "eye gate" and "ear gate" are effective ways of appealing to young and old, will not be doubted by any teacher of today. And it has been well said that a child remembers 10% of what he hears, 50% of what he sees and 90% of what he hears, and sees and does. There is nothing new in this statement. Teachers of olden times were equally aware of its truth; but it has assumed added significance in recent times. And what is more important, the last five or ten years have seen immense strides in the techniques by which the senses and action are used in the process of education. Audio-Visual Aids have therefore come to mean a great deal today, in the field of Christian education, and evangelism. Our task is Christian communication and we must seek every possible means of making it effective.

The question arises, therefore, as to what extent these aids are possible in Sunday Schools in this country. We have over 21,000 Sunday Schools with nearly 42,000 teachers, and 880,000 scholars. They form a substantial section of the Christian Church in its teaching ministry. When forward steps are being taken in increasing measure in general education, those concerned with Christian religious education cannot afford to lag behind. And it is important for Sunday School leaders to take note of the developments. The scholar in the Sunday School needs to associate his lessons with feelings of pleasure and joy if his interest in his faith is to continue and strengthen.

Audio-Visual Aids cover a wide range, from the use of models to the sound-on-film motion picture, or television. Conditions in India, however, do not allow the use of complicated and expensive machines as a general rule. The facilities available in cities, are not available in the villages where the Churches are distributed, very largely. What is possible in a city Sunday School is all too often impossible

[1] Mr. V. M. Koshy, Administrative Secretary of the India Sunday School Union, Coonoor, Nilgiris, is an enthusiastic user of audio-visual aids.

in a village. But it is worthwhile to discuss the extent to which Audio-Visual Aids may be used under varying conditions in this country.

FLAT PICTURES

This is one of the commonest ways of appealing to the eye, and includes photographic prints as well as printed reproductions from photographs or artists' drawings. Illustrations given in books also come within the category of Visual Aids. Unfortunately we do not have enough of them for our purposes and under present conditions it is difficult to import them from foreign countries. One of the best is the series by Elsie Anna Wood. They are the nearest approach to Palestinian life that we have in pictures, and are more suitable for use in this country than most of the others. They are colourful, bold and simple in form so that it is easier to get the message out of them than from others that are packed with detail. It is necessary to warn ourselves of the fact that biblical pictures are not necessarily accurate. They are, in each case, the product of the imagination of the artist. Some pictures that come to us from Western countries present Jesus very largely as a "white man" One of Copping's pictures depicts Jesus as a tyrant in the story of the Cleansing of the Temple. Another, which portrays the story of the Wise Men, shows their number as three, though nowhere in biblical narratives is it said that there were three.

The value of pictures in Worship and devotions has not been recognised by our Sunday Schools. Reproductions of great religious paintings are of immense help to a group of young people gathered together for worship. A single picture on which to focus their attention at the time is more effective than several.

One of the most important things to remember in using pictures is that the needs of children are different from those of adults, and that their value depends very largely on how the class is trained to absorb the appropriate message from each picture. A child or an adult with normal eye sight will "see", but he may fail to "observe" what a picture is intended to convey. One who is not used to pictures, or is illiterate may get a ridiculously wrong impression of the things represented in form and colour in a picture. To him a church in a picture may seem to be anything but that; and a lion on paper may have little resemblance to one in real life. A child again, understands simple direct representations, but it takes training to enable him to appreciate symbolism.

The World Council of Christian Education, New York, has sent out thousands of Old and New Testament "Pictures for Children Everywhere" (Providence Lithograph Co.), to countries all over the world. They are large in size, bold in form and colourful, and

represent one of the latest and best efforts at providing Visual Aids in the form of flat pictures for use in Christian religious education.

The fact that there are not enough cheap pictures for the average Sunday School in this country is a challenge to our Church. Christian printing presses have a special responsibility towards the Church in this respect; for they are the means by which the demand for pictures can be met. Attempts are also being made to raise artists who are nationals. There are already a few of them. Frank Wesley of North India, a student of the Lucknow School of Arts, has already produced a number of biblical pictures. Sunday Schools must take their share in this task. They need to encourage scholars to draw, and thus stimulate religious art. The teacher might, with advantage, get his class to use their imagination to make representations of the lesson in the form of impromptu drawings. It is one of the finest ways of introducing Visual Aids in Sunday School work.

It cannot be said, however, that the efforts of Indian artists have been very satisfactory. Though there is a variety of them, their pictures are somewhat confusing and often tainted too much with non-Christian ideas. While some of the biblical material lend themselves to indigenization, the universality of our Lord is preserved best by keeping Him in His Palestinian setting.

THE FLANNELGRAPH

American Missionaries have been mainly responsible for the introduction of this device into this country. Within the last five years it has become fairly common throughout India and Pakistan. And of the many types of Visual Aids being advocated, the Flannelgraph stands the chance of being more widely used than any other. It is indeed a unique and valuable aid specially in telling stories to children, and considering the extent of illiteracy in this country, it is just as valuable for teaching the Bible to the adults as well. Its great advantage is that it allows the visual representation of the story to be built up in the form of action. The characters appear as and when they come into the story, so that the attention of the children is not distracted by all of them as in a printed picture which presents the entire incident all at once. The method is simple and the materials are inexpensive; the cut-outs can be used again and again.

Ready-made flannelgraph boards, folding and portable, with props to make them stand on level surface, and cloth bags in which to carry them, may be had from the I.S.S.U. Book Depot, Coonoor. Those who do not wish to spend money on it will be able to improvise them. A variety of cut-out sheets bearing on selected narratives of the Bible are also available. Those imported from abroad, have more variety and are more colourful, though they are

more expensive. Others made in this country are cheaper, but are at present mostly plain.

In using the flannelgraph it is essential that the teacher shall not only be familiar with the story, but that he shall have rehearsed it, so that he knows precisely at what point each figure or object has to be placed on the board, and where he is to place it to get the correct perspective. With experience, a teacher discovers how to vary this method. Sometimes he might get a child or another teacher to place the figures, while he tells the story. The flannelgraph is also effective in reviewing lessons, and children may go through the story themselves without the help of the teacher. For larger audiences or in a village larger cut-outs would be desirable. Common figures or groups of figures may well be used for more than one narrative. It is best to keep special groups of cut-outs for particular lessons marked and in sets so as to avoid having to look for them from a mixed assortment of cut-outs.

MAPS, CHARTS, DIAGRAMS, GRAPHS

These, again, are methods that have been advocated throughout the history of education, and used in greater or lesser degree all the time. Progressive Sunday Schools use them today, but what is needed is more widespread practice, both in city and village Sunday Schools alike. It must be admitted that a large variety of these is not available in India, nor in adequate quantities. The point to be remembered is that most of these can be readily prepared by Sunday School teachers. As far as the less advanced village teachers are concerned, the plan adopted in various centres in India, is to get them together for a Training Institute once or twice a year, where they could prepare with skilled help, the necessary maps and charts for use during the course of the year for a given Syllabus of lessons. It is, undoubtedly, better for teachers to prepare their own equipment, rather than make use of those that are available from the market at some expense. Thus a group of teachers brought together for a Training Institute might prepare maps of Palestine, the journeys of St. Paul, the Kingdom of Judea and Israel etc. For charts, they might require those showing the history of the Kings, of the rise and fall of the Kingdoms of the Old Testament, the chronology of the prophets, the manner in which the Bible came to be, the story of early Christianity, the growth of the missionary enterprise etc. Let it be noted that all these are intended for *study*, not for posters, and must be related to the mental development of the pupils. Small children without a historical sense, would hardly understand a chart intended to make clear the chronology of Kings. The wall chart is of real help to class teaching. The family "tree" is valuable when dealing with genealogy, for instance in teaching the Stories of Jacob

and his sons, or about the twelve disciples of our Lord, and again in grouping the parables, particularly in the higher Grades in Sunday School. Symbols (or pictorial representations) are now commonly used in some charts instead of printing the names or titles according to traditional patterns. Graphs again are of value. These may take several forms, one is the "line graph" such as is used to show the temperature of a patient in the hospital. On the other hand the "bar/graph" with coloured vertical blocks are more striking to the eye. A Sunday School might decide to raise money to support a missionary sent by their Church to Africa or Indonesia. A bar graph would then show the amounts raised every Sunday. It stands on the wall to show children the extent of their achievements, and is a great stimulus to increased giving on their part. The same method may well be applied in respect of Bible knowledge also.

It is necessary for every Sunday School to have a library of its own, with maps, and charts and diagrams, etc. for reference by teachers. Phillip's folding maps of Old and New Testaments, Bacon's Bird's-eye-View map of Palestine, Stirling's Atlases of the Life of Christ, of St. Paul's Journeys, and of the Old Testament are all of great value. But teachers must learn to use his own resources, as they did at the Training School in Moga (Punjab) where they got the children to make use of the ground to make a relief of Palestine showing the rivers, valleys, mountains, cities and villages etc. The imported and expensive map could not be a substitute for the rough work done by children with their own hands.

MODELS, SAND TRAYS, WOODEN CUT-OUTS

The use of models are among the simplest in Visual-Aids, though the average teacher in this country takes the line of least resistance by avoiding these. He does not take into account the fact that the narratives of the Bible took place thousands of years ago and in a distant land and amongst a different people and that the child has to have an adequate background to be able to appreciate the spiritual truths which are embodied in them. Models of tools used by carpenters in Palestine would make all the difference to a class studying the early life of our Lord, and the model of an altar used in the time of Abraham would make the story of The Sacrifice of Isaac real to a child. Peter could not have sat balancing himself on the ridge of a sloping roof, and prayed for hours, without falling down and breaking his ribs, and the model of a Palestinian house with terraced roof would make the story intelligible to the child who lives in a part of the country where houses have sloping roofs.

Sand-trays are often considered as mere play-things for nursery children. Yet their value in the Sunday School is unlimited. Whether worked on by children as expression work after a story, or prepared beforehand by the teacher himself, they are excellent Visual Aids. They

cost practically nothing. A few square feet of ground with bricks all round it and a few inches of sand within, would constitute a sand-tray and it is possible even in a village. A few dealwood planks nailed together for sides also make a sand-tray which can be used week after week. It is not necessary for the poor children of our country to have an expensive material like plasticine for making models. Ordinary clay from the field is quite good for the purpose; and almost any Sunday School can manage it. The value of Visual Aids does not depend on the expensiveness of the materials but in the extent to which they are used in teaching. It may be necessary to make some models for comparatively permanent use. The trained teacher uses his resources to prepare various types of models, and it is part of the work of the weekly Preparation Class for teachers in a Sunday School to help untrained teachers to make models suitable for the Sunday's lesson. Models may be made of paper, plywood, wooden planks, in fact with the most common materials.

THE BLACK BOARD

The Black Board is not out-of-date as many are inclined to think. It has immense potentialities in the hands of a keen teacher. In fact its use must be considered basic for Visual Aids in teaching. It should be as important a tool in the hands of the Sunday School teacher as it is with the Day School teacher. The use of this instrument is so flexible that it is, in one sense, the teacher's best ally for effective instruction. And the Bible teacher needs to make full use of the Black Board and in every Grade. What is more important children also can use it creatively in connection with Bible Stories.

THE KAMISHIBAI

This is a Japanese Audio-Visual Aid which might well have the greatest appeal in this country. It is also inexpensive and easy to make. Vernon J. Rossman gives a brief description of this technique in Sight and Sound as follows:

"In any part of town, in Japan, you find the Kamishibai man. His box of candy and small wooden theatre are mounted on the back of his bicycle. Beating his drum, he gathers in the lollypop set. His candy sold, he begins the play.

"His story is illustrated by violently-coloured pictures, drawn or printed on 12 x 16 inch cards. Usually it is from Japanese folk-lore and as bloody as any American comic.

"Each card portrays a scene, rather like the successive frames of a filmstrip. One story may take from twenty to forty cards. The cards are placed in a wooden frame, the front of which is like a theatre facade. The right side is open for easy removal of cards as the story progresses. His script is printed on the back of each picture, just in case he forgets some dialogue."

PUPPETS, INTERPRETATIVE ACTION-SONGS

These methods are now being introduced into Sunday Schools in towns and villages. Puppets are easy to make and can be prepared out of common things without expense. During practical work in the Summer Course of the ISSU at Coonoor, the candidates who were being prepared for leadership in Sunday School work made them out of almost anything—rags and potatoes, tins and cut-outs from magazines. The figures in miniature appeared all the more interesting because they were caricatures of life. Their movements which were manipulated skilfully in the hands of the teacher, gave life to the Bible narratives and the audience was thrilled with the performance; the teacher enjoyed it as much as the class. The message and the purpose were carried through in an atmosphere which was congenial for all concerned.

Interpretative Dancing has potentialities similar to the Puppets. Psalms, and Prayers of the Bible, and simple Bible Stories can be put into rhythm and steps, music and song, in this way. The idea is to interpret the message of the Bible narrative, thro' action and song in unison by the class as a whole. The Bible and the Bible story take a most attractive colour in this way. It secures whole-hearted co-operation and interest from the pupils. The child who learns to do it in the class will want to repeat it at home and everywhere else. This is not a form of entertainment but an educational process which carries with it feelings of pleasure and joy so necessary for all effective learning especially for children. The staff of the I.S.S.U. have demonstrated it with great success in town and village Sunday Schools, and keen teachers in individual schools are making use of it.

BROADCASTS

The A-V. Aids Committee of the N.C.C. of India has a broadcast programme called "The Christian Half-Hour", by arrangement with Radio Ceylon, once a week. It is hoped that the cause of the Sunday School will not be ignored by them. It should be possible for us to get them to make use of the World Sunday School Day as an opportunity. Such broadcasts, however, can only be an occasional item, though it has a great value for the Sunday School movement as a whole.

PROJECTED STILL PICTURES

The magic lantern has been widely used, by Churches and Missions and especially by certain interdenominational youth organisations like the Y.M.C.A. and the C.S.S.M., during the past fifty years. It has the advantage of being robust, simple and straightforward for use, and is capable of clear projection in large size. And a variety

of magic lantern slides were available. It is of special value for the villages since it can be operated with kerosene.

The Slide and Filmstrip Projector is a development of the magic lantern. It is compact in size, portable, and light. It is no more difficult to carry about than a small handbag. One disadvantage about it is that the usual models now available in the market are run on electricity, so that they are useful only for centres that are provided with this convenience. However, electrification of the country-side is going on apace in this country, and there is, undoubtedly, a great future for this type of projector, in our Sunday Schools. The S.V.E. and Aldis Projectors are quite common, though there are many others in the market. These take both slides and filmstrips, and are particularly valuable since a large variety of cheap slides and filmstrips are coming into the market. A different variety of this projector (Keroscope) is now available for operation with kerosene and a petromax lamp. It will be of immense use for village work provided a lamp with high candle power can be got for clear projection. The cost of these projectors, however, is fairly heavy, but regional or denominational Sunday School Unions might well own projectors and send them around in their respective areas.

The A-V. Aids Committee of the National Christian Council of India have two Film Libraries, one in South India, and the other in North India. Films and filmstrips etc. are available from them on rent. Pioneering efforts are also being made to produce filmstrips in this country. The rental charge on filmstrips from the film libraries mentioned above are low and a collection taken in the Sunday School will probably meet the expenses involved.

The Sunday School should regard the Slide and Filmstrip Projector as a powerful ally in teaching the Bible. Experiment and research have proved their value for the purpose. For class teaching still pictures in a series, representing a story or a series of lessons, are of great value. The fact that the time taken to explain each slide, or frame in a filmstrip can be regulated at will by the one who operates the machine, makes it convenient for the teacher. It will be noted that the projection of pictures is not a substitute for teaching. It is only an aid, intended to illustrate the lesson. It may be wise to show the pictures after the lesson is over. Nor is it necessary to have a show after every lesson. In some cases it is better to have a series of lessons in a unit, and climax it with a show covering the entire unit of lessons.

A scripture class in a day school went through the book of Acts for several months, and then had a show for an hour and a half consisting of five filmstrips on the life of St. Paul, beginning with his conversion and ending with his life in Rome; a running commentary accompanied the show. Filmstrips are being made increasingly in colour. This adds to the interest of the class.

THE MOVIE PROJECTOR

Its use with Bible lessons is capable of counteracting to some extent at any rate, the influence of the public cinema on young people. Those with silent moving films and others with sound are available, as also a variety of films from the film libraries mentioned earlier. The cost of the machine, again, is too prohibitive for the average Sunday School. The silent movie projector may cost anywhere from Rs. 1,000 to Rs. 2,000 and in the case of the sound Projector it ranges from Rs. 2,500 to Rs. 3,500, in this country.

"I am the Way" Series consisting of such films as "The Boyhood Home of Jesus", "The Ministry of Healing", "Hours of Trial", "The Living Christ" etc.; Word of God in India; and others produced in India; such as Love Divine; The Prodigal Son; The Good Samaritan; The Heart of India; Transformed Life, are examples of films that are obtainable from our film libraries. J. Arthur Rank Organisation Ltd., in Britain, has produced some excellent sound films for use in Bible teaching. Barabas, The Holy Spirit, those on St. Paul—The Road to Damascus, The Way of Salvation, and Faith Triumphant are amongst the finest and most inspiring films that are available. There is no doubt at all that many more will be available in the period ahead of us. Those in colour will have added attraction. The motion picture in the Sunday School is, surely, one of the best ways of redeeming the child of the present age from the counter-attractions of the secular cinema which is fast ravaging our country.

The Sunday School can only ignore these new devices and techniques in teaching at its own peril; for, when the world around the child is seeking to allure him away from religion, by offering him many a substitute satisfaction, the Sunday School can be made a home of happy experiences for the child—one to which he would want to return Sunday after Sunday. Apart from the personality of the teacher and the grace of God, techniques are powerful factors in the education of the child. Audio-Visual Aids have come to stay. We must guard ourselves, however, against the servant of the Sunday School teacher becoming his master. Means do not constitute ends, in Christian Education. Our goal must be kept clear. It is,

> "For God so loved the world that he gave his only
> Son, that whosoever believes in him
> should not perish, but have eternal life."

Chapter 8

AUDIO-VISUAL AIDS IN THE DISTRICT

S. MAQBUL-MASIH[1]

AUDIO-VISUAL aids can be effective in the district if they are simple, inexpensive and portable. The district missionary may come occasionally with a mobile unit containing a sound projector, microphone and turntable for a very effective programme. But what happens when he leaves? The local Christians and the rural churches are there all the time. What can a village teacher or pastor use continuously? We should emphasize aids the village-level-worker can operate and maintain. They should be available in India and come within the budget.

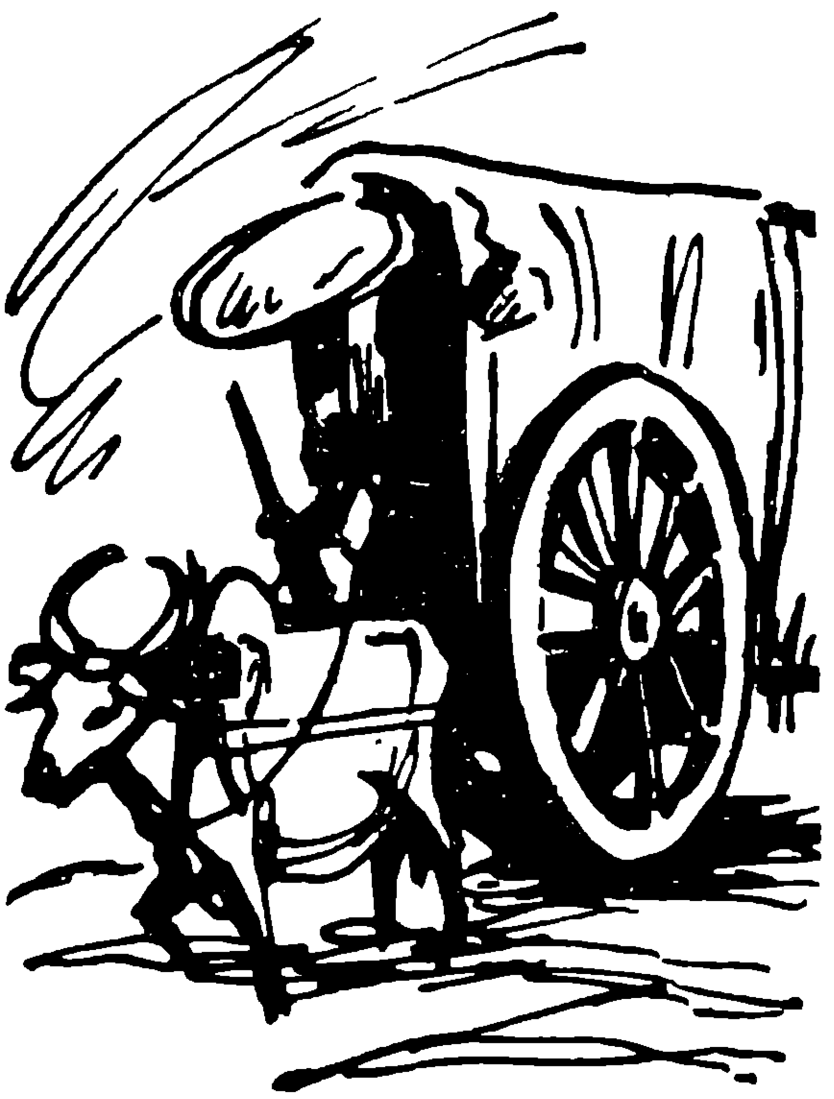
NON-PROJECTED AIDS

Bishop J. W. Pickett says that "The obligation to evangelize belongs to all churches, regardless of location, age or strength". Because of this belief there is great evangelistic activity in *melas* (rural fair), in bazars and village to village visitation especially after the monsoon rains and extending far into the hot-season. The purpose is to let as many people as possible hear the Good News. During this touring, camping and visitation period audio-visual aids are of wonderful help. They are not optional. The only question is, "When will we begin to use them?"

Music is one of the best aids for district work. Sometimes one person will sing and teach the audience the song. Often there is a village band to supplement the work of the pastor. Then there are *kirtan* or *katha* bands (singers and instruments) who can hold non-Christian audiences for hours and "Say it with Sound" Rev. William Dye of the Union Theological College, Bareilly and Rev. L. R. Carver, Nargaon, East Khandesh, are doing wonderful things with their story-singing method of spreading the Gospel. It is effective because it is indigenous and certainly one of "Christ's Ways to India's Heart". Every district leader should send picked delegates to courses on lyric

[1] Rev. S. Maqbul-Masih, B.A., B.D., S.T.M., D.D., Takhatpur, District Bilaspur, Co-ordinator of the Abundant Life Programme and is Chairman of the Mid-India Regional Christian Council Audio-Visual Aids Committee.

evangelism, buy good gospel records to teach his workers better music and have music classes in the annual refresher courses.



Many districts have *melas* or *jathras* (fairs) in which evangelistic work is carried on in camp style. The idea of a special spot where everyone concentrates on spiritual things fits in with India's innumerable shrines and holy places. The Christian *jathra* or *mela* is an effective method of preaching the word of Christ and lifting the spiritual tone of the congregation.

Experience shows that in these gatherings non-projected aids such as a blackboard to give the outline of a Gospel, Maps of Palestine, pictures of the Life of Christ, flannelgraph stories of the Bible, posters of stewardship and our beliefs as well as village bulletins and wall newspapers, puppets, records and drama are effective.

These non-projected aids are useful because much of the work is done by day in the homes and in courtyards. There are religious talks in schools and special group meetings for men, women, youth and children.

While we are considering the simple aids for the district it should be said that the dramatic method is old to India and is a sure way to appeal to the interest of people. In a drama a story comes to life by putting action into it. The Bible is full of incidents which can be dramatized because the Bible is full of action and plots. Each pastor could take a group of young people and have them dramatize an incident from the Bible. District leaders must not try to do the task alone but enlist laymen and youth groups to participate in musical and dramatic programmes.

Puppets are always interesting. Mrs. A. T. Fishman of Guntur and Mrs. A. Brooks of Allahabad have made them and taught many people to use them. The success of the puppet programmes of the Extension Department of the Allahabad Agricultural Institute should be considered when other areas plan methods to put-over an idea in village settings. They have found in Allahabad that puppet plays

on small-pox have motivated many people to come to dispensaries the next day for inoculation.

Some of our brother workers hesitate to use audio-visual materials because they think the "thing" will get between the people and their message. This is a groundless fear if we consider they are only "aids". These are "aids" to help us impart spiritual truth. No matter how fine our equipment and materials they must not be the important thing. A personal relationship must be maintained between speaker and people. Visual aids should never turn a religious programme into a *tamasha* (show).

One advantage of the simple aids is that the village level worker can use them. After the mobile unit moves to another village the village worker needs tools he can use. The aids we have discussed can be mastered in a short training school or institute. In fact the village people can help make or prepare some of them which by giving them a pride in achievement will win their sympathy and co-operation.

SOUND

The district worker is acquainted with the battery-operated public address systems carried in *tongas* (wagons) at election time in the most remote villages. No one is a stranger to a microphone any more. The next step after simple non-projected aids would be a hand-wound gramophone with a set of religious records such as those produced by Gospel Recordings and the N.C.C. A-V.A. Committee. Each village worker should have a gramophone and records.

Today there are dry-battery public address systems that make it possible to speak to hundreds of people with simple equipment. India is producing more and more sound equipment which should get into the district. At least in the field of amplifiers (PA Systems) foreign products are no longer necessary. A large business of electronic equipment production has sprung up in Delhi since 1947.

FILMSTRIP PROJECTORS

Every village has a petromax lantern so the 35 mm. filmstrip projector which operates on kerosene oil is also no stranger. The S.V.E. International or British-made Keroscope is easy to operate and should be used. My own experience is that we can teach a great deal more through slides and filmstrips than through movies in the district because the former can be projected at any speed as desired. Most films are produced for sophisticated audiences and move too fast for rural India.

AGRICULTURAL *MELAS*

I have already said that India is a great country for *melas,* and have discussed religious *melas.* Of recent years there are also educational *melas* stressing agriculture, live-stock and industrial exhibitions. At these *melas* a public address system with microphone, turntable, cinema film and other mass media are a distinct advantage. But even in large *melas* the simpler aids can be used with smaller groups at several places by workers who combine to plan a multi-aid programme. There is no reason why a drama, puppet show, music concert, exhibit, film show and lecture on the same subject cannot be going on at the same time in selected spots. This is the way Rev. George Garden of Zaheerabad can handle 7,000 Christians at one of his large yearly *melas.*

CINE PROJECTORS

The type of projector you use in the district is determined by the source of light. If there is no electricity the S.V.E. International Projector will run on kerosene oil. Several 35 mm. projectors operate on batteries. Any projector not having a blower can operate on a 6-volt DC car battery by merely changing the bulb. In fact in our district we advise 3 bulbs for each projector, (1) 6-volt for use with a jeep or car battery, (2) 110 for use with a portable gas-electric generator, and (3) 220-volt for use with regular city electricity in India.

When 16 mm. movie film is used then a portable gas-electric generator is needed. This is a valuable addition to district equipment. The Homelite, Onam, Master and Kohler are light weight, operate on petrol and give good service if they are carefully maintained. Generators producing 1500-watts of 110-volt A.C. 50 or 60 cycle electric current will operate all the equipment the average person will need plus a string of electric lights to give colour and excitement to the programme site.

When you project motion pictures a large crowd gathers and it is necessary to use a microphone to be heard above the noise. Many people use their 16 mm. sound projector only for film which is a mistake because it is both a sound film and a Public Address (PA) system. Sound film projectors should be used far more than they are for a PA system and for music.

A spring-driven gramophone with a magnetic pick-up arm can be used with the sound projector or separate PA system. If you have a sound projector (RCA, Victor, Bell-Howell, Ampro, Natco, Pathe, DeVry, etc.) plus a microphone and turntable you can do much in district work. This equipment cannot be operated by every man: but in every district there are mechanically minded teachers and pastors who could learn to be operators if they were encouraged and trained.

TRANSPORT

Transportation is a problem. Some district workers walk; so the portable flannelgraph board, the jet-men flashcard sets and pictures of the Life of Christ are no problem. However, each man should have a khaki bag to carry his aids in for protection against rain, dust and perspiration. More men ride bicycles so their equipment must be able to stand bumps and strain. The electronic equipment can be transported by train, ox-cart or bus if it is properly boxed. Fortunate people have their own vehicle and can easily transport all their equipment. Rev. Gurbachan Singh discusses transport in his chapter.

Miss Ethel Calkins of Moradabad said that the problem on the district was not so much to get equipment to people as to get people to use it. There are unused pictures, maps, flannelgraph and books in many village level-workers' homes. One discouraged teacher used his plywood flannelboard for a door to his chicken pen. If leaders would encourage the village worker to use these aids perhaps more would be done.

Of course, for any programme to succeed, the leader must be vitally interested in it. Audio-visual aids in the district are no exception. The district superintendent must be vitally interested in their use. Not all are mechanically minded but all can learn certain skills and show an interest. A district superintendent may be too busy to prepare a set of puppets, fix a stage and write a play; but he can encourage his workers and when one does achieve this goal he can offer audible congratulations. The top leaders can do much to "make" or "break" the use of audio-visual aids on the district level.

The National Christian Council of India through its Audio-Visual Aids Committee holds several institutes and training courses in many parts of India for the benefit of those who are interested in learning the proper use of these aids. This year in connection with the Leonard Theological College, Jabalpur, they are giving a nine months' intensive audio-visual training course. From time to time Regional Christian Councils also arrange for such training within their own areas. We would do well to send delegates and introduce these aids in our district.

Chapter 9

AUDIO-VISUAL AIDS IN THE SCHOOL

RENA SINGH[1]

AUDIO-VISUAL aids are essential tools for the school teacher. It is with these that she can make the classroom experience of the child rich and meaningful, concrete and memorable. Experiences are rich when they are accompanied by qualities such as pleasure, emotional gratification, and personal satisfaction. Good teaching involves the feelings as well as the intellect.

With the use of audio-visual aids the classroom can become an interesting place where the pupils have interesting experiences—where they can see, hear, taste, touch, make, plan, experiment, try and do. This education becomes not merely a phase of an individual's life, but is co-extensive with life itself, and so like life becomes rich and adventuresome. This may sound Utopian, but it will work if we will only let it!

A VARIETY OF AIDS

The school teacher has in her hands the responsibility of moulding young, impressionable minds, and it is up to her to take advantage of the best teaching methods and materials. There are a variety of ways in which audio-visual aids can be incorporated into teaching, but not for one moment should the teacher think that she can be substituted by these audio-visual aids, nor should they be used as an escape mechanism. The true relationship of these aids to teaching should be realized by the teacher before she goes full swing into an audio-visual programme.

Audio-visual aids do not necessarily have to be elaborate. Begin with what you have in your school and in the environment around you.

TYPES OF AIDS

Here are a few suggestions for classroom use:

1. Flat pictures.

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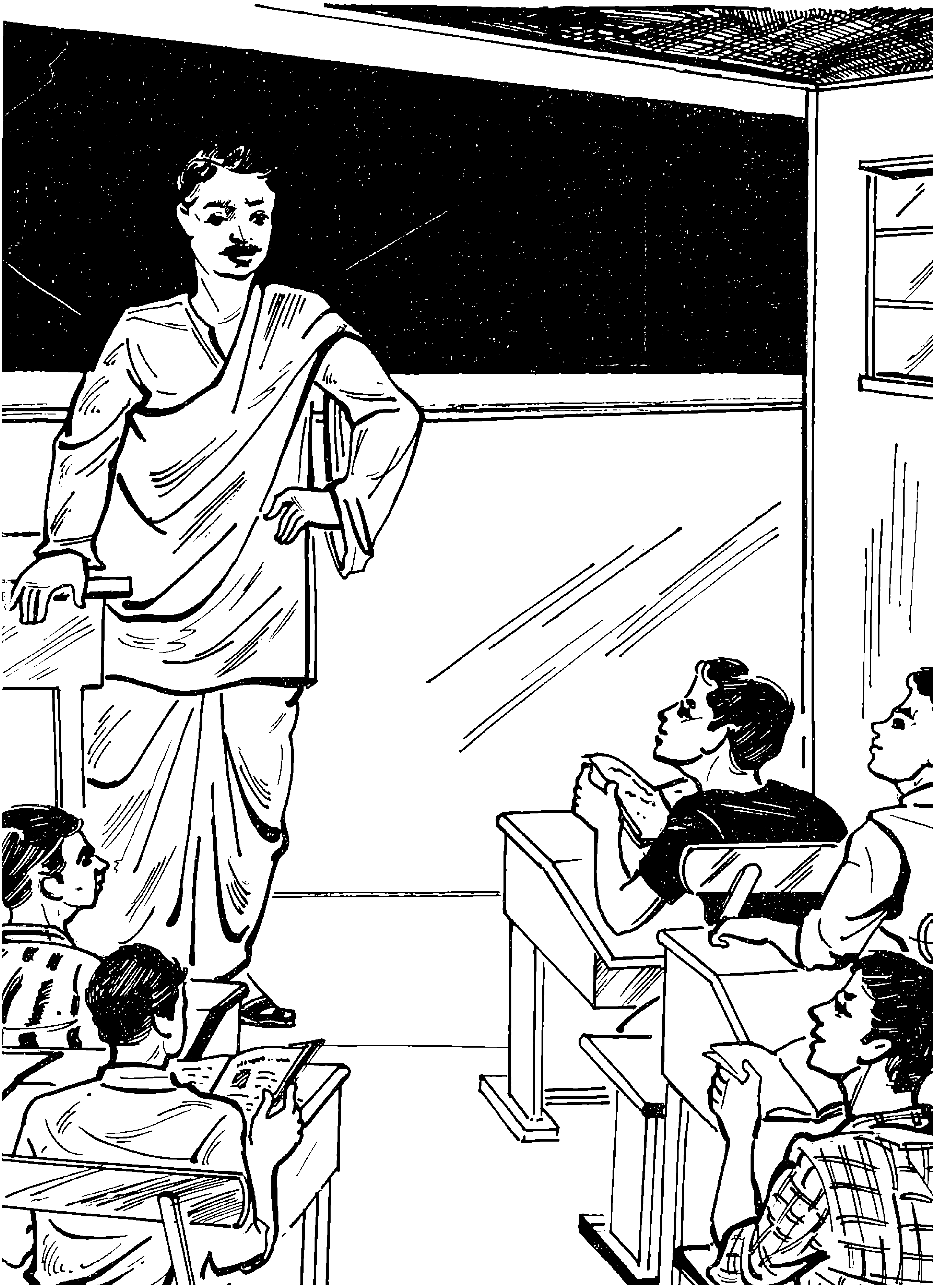
[1] Miss Rena Shakuntala Singh, M.A. (Geography), Boston University, M.A. (Education), Columbia University, Lucknow, Tourist Information Officer, Government of India, is interested in audio-visual instruction in schools.

This teacher does not use any "new fangled tools" "I teach as I was taught," says Gasi Ram.



Lucky boys to have such a teacher and classroom aids. Sundar Joshi is teaching as he was taught to teach.

2. Sand tables, bulletin boards, models, miniatures, and mock-ups.
3. Drawings, sketches, posters, flat maps, charts.
4. Exhibits, objects and specimens.
5. Dramatization.
6. Slides, filmstrips, and motion pictures.

STILL PICTURES IN THE CLASSROOM

The still picture is a vital force in vitalizing and enriching instruction. Flat pictures have always been used in schools to some extent, and these can be continued to be used effectively and cheaply. Pictures cut from magazines and old books can be used. Photographs and illustrations are another source. If the pictures are really good they should be mounted and filed so that they can be used for future reference. If possible they should be mounted on a standard size cardboard and filed and catalogued according to subject-matter. A standard size is desirable because it facilitates filing, storing and preservation. The cardboard should not be of too heavy a texture but enough to give the picture support and body.

USE OF PICTURES IN A MEANINGFUL WAY

1. Pictures can be used to brighten up classrooms. Most of our classrooms are drab and unattractive. A weekly or bi-weekly display of pictures on the classroom walls will change the tone of the classroom. Committees of students can be made responsible for the exhibit and it should be seen that the display is closely related to the unit of study. The exhibit should be made pleasing and attractive. Good, artistic arrangements are very necessary. A striking, appropriate headline for the whole display would be helpful. Don't use too many pictures. Use only a few and arrange them skilfully.

2. Use pictures for careful study.

   Children can very often read more meaning in a picture than in written material. Teachers should encourage the children to find the answers to their questions in pictures because pictures very often clarify meanings and make the abstract more concrete.

3. Use pupil participation.

   Pictures inspire pupil participation and children will readily talk about a good picture. There can be intelligent and interesting discussions about pictures and their meanings. Pupils making their reports to the class may be encouraged to use pictures to illustrate their reports.

5

4. Introduce a subject and arouse interest.

   A few good pictures of life in Japan will help to interest pupils in that country. Thus motivated, interest will be aroused, resulting in a desire to read, find out, make and do.

5. Bring the outside world into the classroom.

   It is up to the teacher to create a rich, educational environment for her pupils; to bring the local community, the province, the nation, and later the whole world into the classroom. To bring the world to the children we must use pictures.

6. Enrich reading.

   Still pictures are so inexpensive that any teacher or school can afford to provide an abundant supply. Pictures can make new words meaningful and can turn word pictures of text-books into visual pictures. Pictures are an excellent supplement to assigned reading.

7. Correct wrong impressions.

   Every child has mistaken impressions of history, geography and other subjects. Well-selected and well-printed pictures help prevent this condition. Pictures also help retention of what is taught.

TECHNIQUES OF TEACHING WITH STILL PICTURES

1. Agree on general story the picture tells.
2. Help pupils observe important items.
3. Compare and contrast items.
4. Build concept by showing different stages in a process.
5. Help pupils draw inferences from visual clues.
6. Check results of study.
7. Guide pupils in search for more information required.

CRITERIA FOR SELECTING PICTURES

If pictures are to serve their maximum purpose they should be selected with a certain criteria in mind. Quality rather than quantity should be the first criterion in planning a picture collection for teaching purposes.

1. A good teaching picture is clear and definite; it gives an accurate impression; it portrays vividly that which it presents.
2. It is authentic and represents the situation as one might see the actual scene.
3. Simplicity of content is a prime essential, especially for young children. A complex picture often distracts attention instead of focussing it on the main points.

4. A picture which proposes to show current events must be up to date.
5. Colour enhances the value of pictures, but the misuse of colour very often leads to erroneous ideas. A poorly coloured picture should not be used. A good quality black and white picture is far superior.
6. The picture should be technically excellent and should be large enough to be clearly visible.
7. The picture should be adapted to the maturity level of the children.

I. GENERAL SUGGESTIONS

1. Search for best pictures.
2. Use only those that are needed.
3. Ask skilful questions to stimulate observation and thought.
4. Allow time for study.
5. Teach skill in learning from pictures.
6. Discard pictures of temporary value.
7. Use only a few pictures at a time, and use them intensively.
8. Use pictures for a definite purpose or purposes.

II. THE USE OF SAND TABLES, BULLETIN BOARDS, MODELS, MINIATURES, AND MOCK-UPS.

The elementary school teacher can very effectively make use of these contrived experiences enumerated above, if she will use a little initiative and originality.

Sand tables are a visual media which have been used in schools, but sometimes their purpose is forgotten by the teacher. The scene which is depicted by the sand table is allowed to stand a duration beyond its usefulness, and thus the true teaching value of the medium is lost, and merely becomes a decorative piece. Once the unit of study is finished and the table has served its purpose the scene should be dismantled.

Pupil participation in the making of sand tables, bulletin boards, miniatures and mock-ups is very essential. This arouses keen interest in the unit and encourages research on the part of the pupils. Creative and constructive suggestions of the pupils should be incorporated in the making of these things, and the art work should be the major contribution of the pupils.

Bulletin boards are a highly educational visual aid, but they have been seriously neglected. A bulletin board is a place for the posting of timely, brief items which are of interest to the pupils. They should be posted at places round the school building where they will attract

the attention of the students. The material posted, whether it be the announcement of some school activity, or whether it be news, it should be attractive and newsworthy. The news, of course, should be adapted to the maturity level of the pupils. Children will be strongly attracted by colour and this factor should be exploited advantageously by the teacher. In the elementary school the teacher will have to do most of the planning but even in the elementary school the children of the higher grades can be asked to participate in the planning.

Bulletin boards can be made in a variety of ways. Some can be made out of plywood or any other inexpensive wood which is light and durable. This board can either be hinged on to the wall permanently or it can be made portable. Another inexpensive method is to cover wall space with a piece of durable cloth and things can be tacked on to this.

Models, miniatures and mock-ups help students to understand the construction, mechanism, and the operation of heavy equipment and machinery which cannot be brought into the classroom or which is not accessible even through a field trip. If the pupils are allowed to build models and miniatures for themselves they will also learn more and will show more interest in the unit of study.

III. USE OF DRAWINGS, SKETCHES, POSTERS, MAPS AND CHARTS

The above visual symbols are all usually large, attractive, and attention-commanding, and therefore, can be used very effectively with elementary school children. Teachers can use these for the purposes of motivation, for concept building, for supplying information, or for reviewing and testing.

IV. USE OF EXHIBITS, OBJECTS, AND SPECIMENS

Schools should encourage the showings of exhibits which are a product not only of the school but also those which are borrowed from outside sources. In an exhibit a group of articles and materials are arranged to convey an unified idea.

Edgar Dale observes:

"An exhibit can be simple, calling for merely a few moments observation, or it can involve several sensory activities. A child not only sees a products exhibit but can handle, feel and smell the displayed articles. Teaching exhibits, therefore, range from the merely visual to those involving tactile, olfactory, auditory and other senses. You can make your exhibit as simple or as complicated as you wish—or, rather as your teaching problem demands."[1]

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[1] Dale, *Audio-Visual Methods in Teaching* (New York, 1946), p. 157.

SOME STANDARDS FOR EXHIBITS[1]

1. An exhibit is seen, not heard.
2. Put only one big idea in your exhibit.
3. Put your exhibit in a place where it is sure to be seen.
4. Make your labels short and simple.
5. Labels should be uniform and legible.
6. Motion in an exhibit attracts attention.
7. Be sure your exhibit is well lighted.
8. Colour may add interest and attractiveness.
9. Sound and various mechanisms may add interest and attractiveness.

Objects and specimens are common collections in schools. They are a good substitute for the real thing itself and help children to form generalizations when the direct experience itself is not possible. Specimens for nature study are brought into the classrooms, and even though they are the real thing minus the setting, they can be handled and studied directly. Children should be encouraged to bring objects and specimens into the classroom to build up the collection. Discretion, however, should be used on the part of the teacher to see that useless and valueless objects are not made part of the collection. Too much material and too many details overwhelm the pupils.

V. THE USE OF SLIDES, FILMSTRIPS, AND MOTION PICTURES

Slides, filmstrips, and motion pictures all three require projection equipment before they can be used at all. Most elementary schools in the country cannot afford their own equipment, therefore, the use of these aids is not as extensive as we would like to see it. There are, however, agencies which do supply projection equipment but they need the guarantee that the projectionist is experienced. If, however, schools can afford such a programme they should go right ahead using these aids as effectively as possible, never forgetting the true relationship of these aids to teaching.

VI. THE USE OF RECORDING EQUIPMENT

There are many reasons for the alert teacher to use a wire or tape recorder in the elementary school. Some reasons are:

1. Creates poise and confidence in children.
2. Gives opportunity for creativity.
3. Creates interest.
4. Provides opportunity for children to hear their voices for the first time.

[1] Idem. op. cit. p. 168.

5. When used correctly, recordings can be a great educational tool.
6. Adds variety to routine class procedure.
7. Broadens experiences.
8. Encourages preparation on part of the pupil.
9. Demands better teacher preparation.
10. Operation gives responsibility.

ADVANTAGES OF TAPE RECORDING

1. No needle scratch—very low noise level;
2. No break in continuity due to changing records or turning them over;
3. Unaffected by extremes of temperature that affect other methods of recording;
4. Instantaneous play-back without processing;
5. Longer recording time; 15-30 or 60 minutes;
6. Plays and records in any position;
7. Excellent fidelity without elaborate precautions or special skills in recording;
8. Any portion of record can be erased or altered without harm to adjacent portions;
9. Easy to splice;
10. Extremely easy to cut and edit;
11. Tape from one reel can be spliced to another reel;
12. Rewinds rapidly;
13. One may superimpose.

ADVANTAGES OF THE DISC RECORDING

1. Records can be played on regular turntables;
2. Storage takes little space;
3. Discs for experimental purposes are inexpensive;
4. Discs may be purchased anywhere;
5. Wide range with good tone;
6. Disc recorders arc tried and proven;
7. New aluminum discs are unbreakable;
8. Discs are long life without repairs.

VII. STANDARDS FOR THE SELECTION AND USE OF AUDIO-VISUAL MATERIALS

1. Is the audio-visual material true to the time, place, and event it represents insofar as we know—costumes, utensils, background, and so on? Is the interpretation of persons (facial expressions and posture) true to our best knowledge and understanding of the subject?

2. Is the character and technical quality of the art or photography (faces, figure construction, brightness of colour, accuracy of proportion between different objects in the picture and so on) of such a nature that it will be acceptable?
3. Does the material have a central theme, and does the composition of the material support that theme?
4. If the material depicts other racial, national and cultural groups, does it lead to an appreciative response toward these groups on the part of these with whom it is being used?
5. Is the content of these audio-visual media true to our understanding of a Christian message?
6. Does the audio-visual material serve the purpose for which it is being used?
7. Will the technical quality of the material (photography, sound, sequence, printed matter, etc.) meet the highest possible standards?
8. Is it appropriate for the age level with which it is being used?
9. Will using it lead to further learning experiences?

VIII. CHILDREN'S AUDIO-VISUAL CHECK SHEET

GENERAL

———photography poor	———too long
———doesn't fit any of our units	———too old for age-group
———too many distracting features	———colors gaudy

PLOT

———not in child's experience	———action insufficient
———unchildlike	———suspense insufficient
———"about" and not "for" children	———outcome poor
———poorly organized	———animals out of character
———ideas difficult	———too sentimental
———motives wrong	———too fanciful
———religious emphasis wrong	———moral too obvious

SCRIPT

———information inaccurate	———conversation stilted
———vocabulary difficult	———conversation insufficient
———not authentic	———material irrelevant

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Chapter 10

AUDIO-VISUAL AIDS IN THE THEOLOGICAL SEMINARY

HERBERT JAI SINGH[1]

BESIDES the main task of interpreting the Christian faith an equally important function of a theological seminary is to pioneer in the best methods for the communication of the Christian Gospel. By and large through the centuries the message of the Christian faith has been proclaimed by word of mouth. It has been so because the art of communication had been, until recently, in its infancy. During the last fifty years, however, a tremendous revolution has taken place in this area. People and organizations who want to attract or capture the minds of men are making use of the latest development in the art of communication. We are living in an era of mass communication, and people are being won to ideologies and creeds not so much as individuals as great masses. It is only recently that the Church is beginning to acknowledge the effectiveness of the aids available for the communication of the Gospel. Theological seminaries in India, if they want to reach the hitherto unreached millions of this country, must give increasingly more attention to the latest developments in the art of communication.

The seminaries can make use of audio-visual aids for two main purposes: for teaching their own curriculum and teaching theological students the use of these aids so that they can employ them in their future ministry.

As aids in the teaching of theological subjects the use of maps, charts and blackboards has been long familiar. Besides these, theological teachers may use flashcards for the teaching of languages, especially in the memorisation of vocabulary.[2] For pronunciation, intonation and accent tape and disc recordings are especially useful. Many of the scenes of the Bible can be made vivid and alive by the use of movies.[3] Often colour slides and film-strips of the Holy Land

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[2] The present writer has found the use of flashcards especially effective in the teaching of Greek vocabulary.

[3] Films such as the *Sign of the Cross, The King of Kings, Transformed Life,* etc.

give the students a feel of the land of Palestine better than any amount of mere words. The journeys of Paul can be illuminated by travelogues borrowed from a library of religious films. In the teaching of Indian popular religion projected aids can be of immense help in making vivid to the minds of students, for instance, places of Hindu and Buddhist pilgrimage. For improvement of pulpit preaching students may be asked to hear their own preaching from a tape recording and so learn the precious art of self-criticism. In all these ways the new methods of audio-visual aids can become real assets in making theological education more interesting, colourful, and effective. They can help alleviate much of the abstraction which is often the besetting sin of theological teaching. Through audio-visual aids students can be made to re-live some of the experiences which lie at the root of all genuine religion.

If students have learnt the effectiveness of audio-visual aids during their careers in the seminaries, they will naturally take to them when they occupy positions of responsibility as ministers. There will be many occasions when audio-visual aids will come in handy in the work of a minister. In the conduct of worship audio-visual aids can be used to create a worshipful atmosphere. This can be done through various techniques. Special music may be played to create the proper mood. Often altar decorations, the use of pictures, flowers of different colours arranged artistically will produce a worshipful atmosphere. Sometimes in case of more elaborate worship services light effects may be used to channel the emotions of the worshippers. Some or all these aids can be used to advantage in the guidance of men in their worship to the end that they give themselves to the creative working of a holy and loving God.

The pastor can use audio-visual aids in making the social life of his people more interesting. As a leader of his community he is responsible not only for the guidance of worship but also for directing habits of choosing proper types of entertainment. In the villages of India people have a lot of leisure time in certain seasons and there are few resources to enrich the use of these wasted periods. An intelligent village preacher could well fill this time with interesting and instructive entertainment with the help of audio-visuals suitable for the Indian rural scene. In the cities, for lack of proper entertainments young people as well as their elders have to go for commercialised entertainments which may be sometimes good but at other times harmful, catering to lower ethical and aesthetic standards than the ones accepted by the Christian community. In such situations the minister can greatly help by organising a programme of social activities for his church that will be healthy, artistic and interesting. Audio-visual aids can be an invaluable help in such a programme.

Audio-visual aids can be effectively used in the educational acti-

vities of the local church. In Sunday School classes, in the activities of the youth groups, in the meetings and functions of the Student Christian Movement and the Young Men's Christian Association, in leadership training courses, at camps and retreats, in fellowship groups—in all these situations audio-visual aids are an invaluable source of help to the minister. Most educational institutions engaged in the promotion of secular learning are already making use of such aids. Should the church fall behind? Religion demands the best from us and it is the duty of every responsible minister to make use of the most effective means whereby he can impart the teachings of the Christian faith by associating these truths with vivid experience. Furthermore, through the use of audio-visuals we can appeal to the various bodily senses through which learning takes place and thus make a multi-impact on the minds of the youth. The educational programme of the church, often made routine by traditional and hackneyed methods, can be made more interesting and effective by the use of audio-visual aids.

Audio-visual aids can be used to attract people to the message of the Christian Gospel. The Indian environment is predominantly a non-Christian environment. Often non-Christians may shy away from a preaching service but will listen to good Indian music or see a puppet show or be captured by a good flannelgraph story told in their own dialect. Ours is a predominantly illiterate environment. Here people learn more by the direct method of seeing than by the abstraction of language. In both these situations audio-visual aids are a real asset to capture the interest of and instruct the people.

Audio-visuals can aid in reaching those whom the natural voice of the evangelist cannot reach. Radio and television has put within the reach of the Christian preacher whole masses of peoples whom he could not possibly have reached a generation ago. This is an age when great masses can and have been won to new ideologies by those who have made use of proper and adequate facilities of communication. So far the Indian Church has been able to do little in the way of using the radio for the proclamation of the Gospel but plans are underway at the Leonard Theological College whereby the facilities of Radio Ceylon may be used for communication of the Gospel.

If audio-visual aids are such a valuable asset for the preaching of the Gospel, why is it that the Christian Church is not making better use of these? The usual answer given is that audio-visuals are an expensive proposition, out of the reach of the poor Indian Church. This reason is true only for a certain type of audio-visual aids. There are audio-visuals that are inexpensive and well within the reach of the Indian Minister. These are, for example, pictures, posters, flannelgraphs, glove puppets, the last one being a favourite of the Indian villagers. Audio-visuals need not always be expensive. In

fact the present trend in the audio-visual movement in India is to use inexpensive equipment suitable for our conditions.

What are our theological seminaries doing to train ministers in the effective use of audio-visual aids? Only one theological seminary of the B.D. grade has a regular department of audio-visual aids.[1] Others, with the exception of one, do not even have a committee assigned to look after the programme which employs audio-visual aids in the college. Most of them are ill-equipped as far as the modern audio-visual materials are concerned. Only one has a movie projector, three have slide projectors, one opaque projector. This little equipment, with the exception of one college, is very seldom used, "once or twice a year" Only one school has a record player, a small library of records, an amplifying system, and a wire recorder. Two schools have maps to illustrate Biblical materials. None of the schools use pictures to illuminate class materials. Three of the schools record as having flannelgraphs. Only one school is making use of flashcards in the teaching of Greek vocabulary. All the colleges, with the exception of one, have a drama every year. With the exception of one, none of the other colleges offer any courses on the use of the various types of audio-visual aids.

The main reasons given for a lack of audio-visual facilities in these seminaries are, scarcity of funds, overcrowding of the already crowded schedule of studies, lack of trained personnel and occasionally the lack of facilities on the fields when the students leave the four walls of the seminaries.

If the above objections could be met all the seminaries of the B.D. grade would be willing to start either a department for audio-visual aids or organise a committee to look after the programmes using audio-visual aids in the college. This is based on the conviction, expressed by all, that audio-visuals are effective aids in the proclamation of the Gospel.

The following excerpts from correspondence with some of those responsible for guiding theological education in India tell us what they think about the place of audio-visuals in the Indian theological colleges: "The syllabus," writes one, "is already over-crowded; audio-visual aid methods may be taught by means of conferences and summer schools, like the I.S.S.U. at Coonoor. We recognise the value of audio-visual aids in teaching and evangelism but feel that there are limits to what can be done in a three-year course at a Theological College. Possibly a lecturer on audio-visual aids might spend the inside of a week in the colleges, illustrating the uses to which they can be put." The head of an other theological seminary writes: "As you will see from my replies overleaf I am personally very keen on having an audio-visual department opened in this College; or if

[1] These facts concerning audio-visual aids in theological seminaries in India were collected through a questionnaire sent out to the seminaries of B.D. grade.

that is not feasible to have the services of the audio-visual aids through a committee for part of the session. We have absolutely no funds at our disposal for this purpose." He goes on to recommend, "As a first step in this direction we shall welcome the visit of an audio-visual team of experts—to give addresses to demonstrate the aids—about a week or 10 days" at the end or the beginning of the year.

To the best of my knowledge, only at the Leonard Theological College is there a department of audio-visual aids that might well serve as a model for other seminaries. The department was started in 1948 and since 1951 shares a part of the curriculum of the college. It is now well equipped with various types of projected and non-projected aids. While it is true that many of these aids are too expensive to be within the reach of any one Indian Church, the department is experimenting in aids that are suitable to the cultural situation of India and the financial conditions of the Indian Churches. I am convinced that the department is making a valuable contribution both to the life of the seminary as well as to the furtherance of the Christian Gospel by training men in the use of more efficient means for the propagation of the Gospel. There are excellent programmes at regular intervals organised by the audio-visual aids department. One evening in the week is set aside for an audio-visual programme. The department has organised a local broadcasting system which often supplies music and news for the seminary community. Students who are interested in music find opportunity to develop their interests and talents through facilities provided by the department. During the annual S.C.M. drama the stage decorations and sound manipulations are almost entirely in the hands of the audio-visual aids department. The darkroom section of the department is an invaluable help in making photo-static copies of important documents.

An important step forward was taken when in June 1954 the National Christian Council decided to cooperate with the department of the college to conduct the "National Christian Council's Audio-Visual Training Course" on the campus of the Leonard Theological College. The combination of the equipment and personal facilities of the National Christian Council and the Leonard Theological College has put at the disposal of the trainees an adequate supply of material and excellent teaching facilities. In addition to three full-time teachers, expert specialists are invited frequently to conduct classes in their particular line of specialisation. Courses are offered in music, flannelgraph, sound and recordings, puppets, graphic materials, objects, maps, handling and use of equipment, Christian drama, script writing, conduct of worship, photography and so forth.

In the light of the above discussion, in conclusion, we may say the following things:

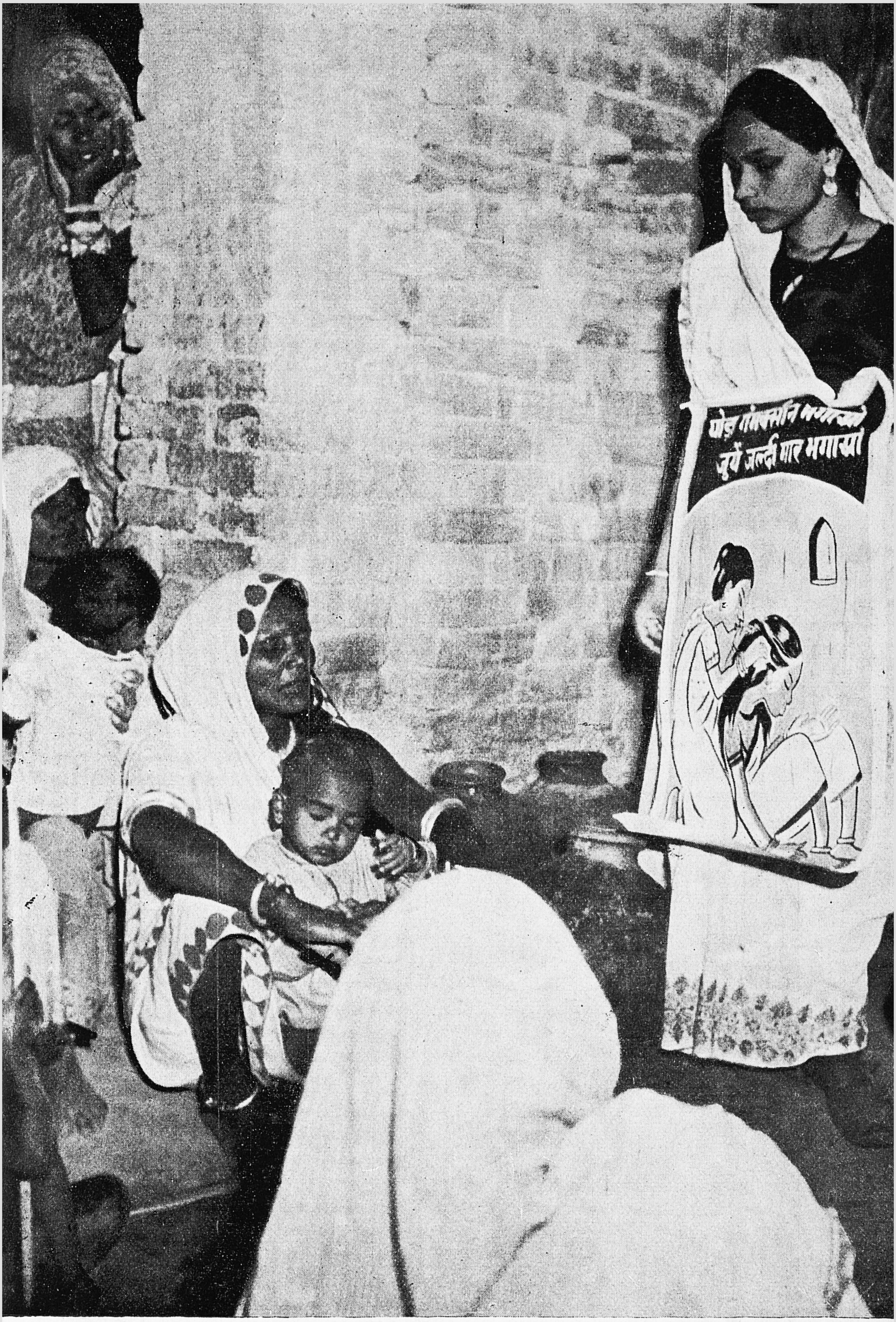
1. Audio-visual aids can make a double contribution to the

life of a seminary: (*a*) they can enrich the teaching and entertainment facilities of the school, and (*b*) they can help the students to become interested and to learn the use of audio-visual aids so that when they assume responsibilities as ministers, they will avail themselves of the benefits of these aids.

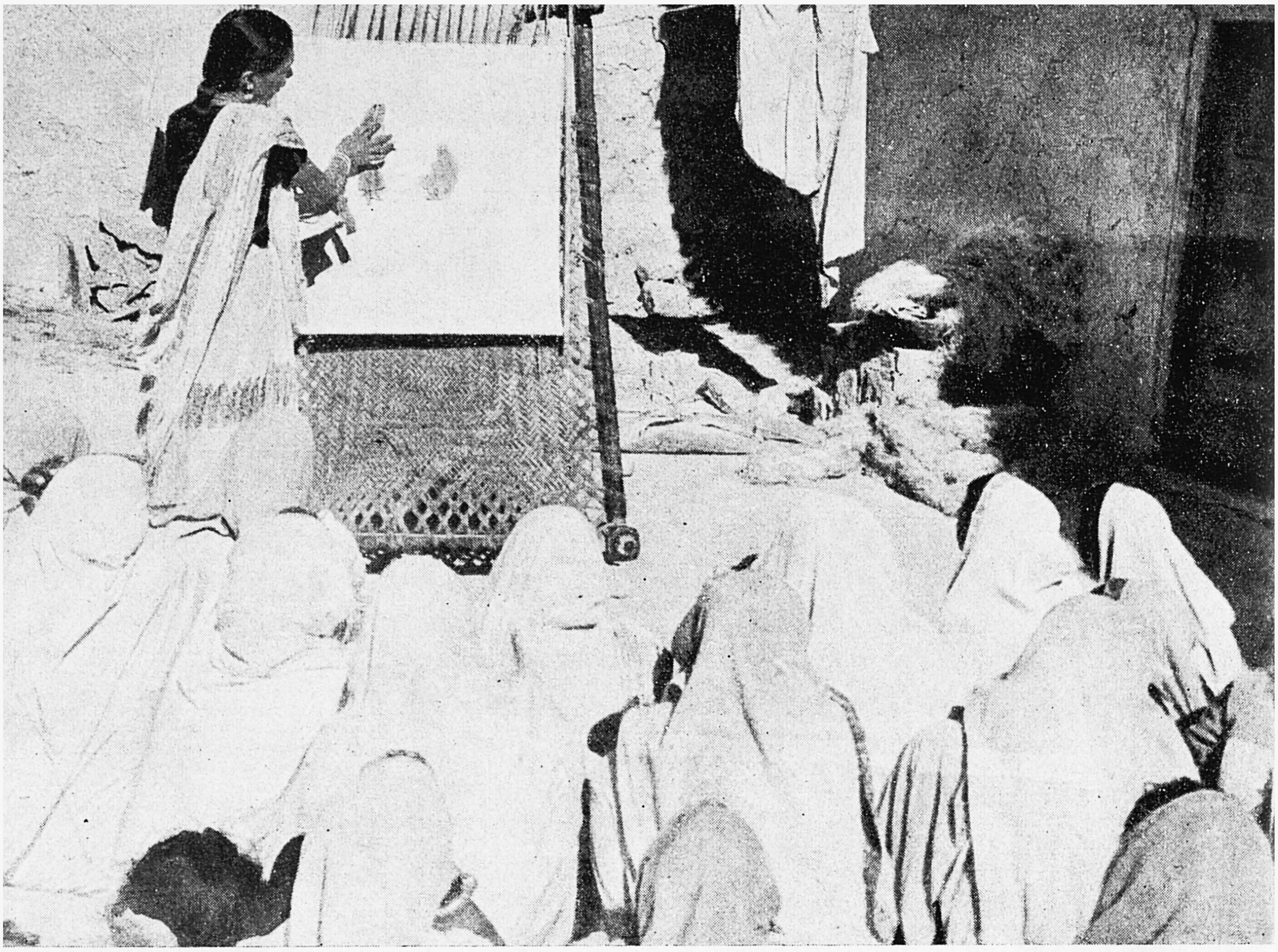
2. The great effectiveness of the audio-visual aid methods is recognised by most of the heads of the theological seminaries.

3. The seminaries need the guidance of expert personnel to help them see the scope and possibilities of audio-visual aids for the furtherance of the Gospel.

4. There is need for research in the field of audio-visuals in India. We need to develop more but inexpensive aids suitable to our cultural situation which do not exceed our financial means.

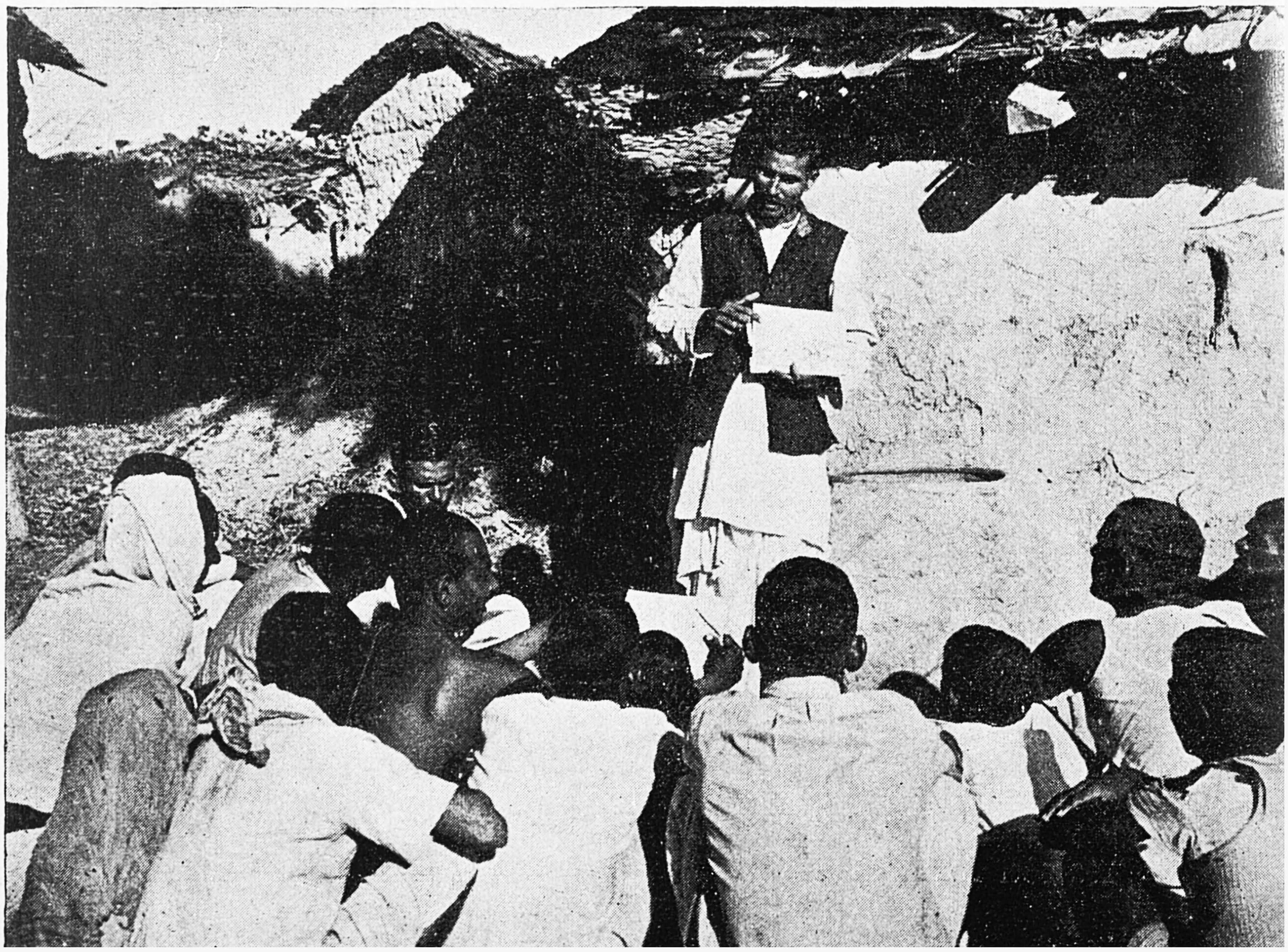


A woman *Gaon Sathi* (village worker) showing a Poster to village women in preparation for a demonstration of treating hair with insecticide to control lice.



woman *Gaon Sathi* (village worker) using Flannelgraph as a visual media. A *charpai* (bed), stood on end, is sufficient to fix the flannel. The *charpai* is tilted slightly by fixing bricks under the legs.

A village worker using flash-cards as a visual medium for a story. Note the way and height he holds the cards.



Chapter 11

AUDIO-VISUAL AIDS IN AGRICULTURAL EXTENSION IN INDIA

T. A. KOSHY[1]

ALTHOUGH rural reconstruction has been going on in India for over 40 years, Agricultural Extension, as understood in Western countries, is a recent introduction. With the establishment of the Community Development Projects in 1952 under the Community Projects Administration of the Government of India, Extension has been recognized as a method of rural development. One of the import differences between the old methods of rural reconstruction and today's Extension is the use of multipurpose village workers. They work on every aspect of rural life and try to bring about improvements through education on all age levels. For this process of education, the use of Audio-Visual aids is absolutely imperative, especially as a vast majority of the rural people are illiterate. It is encouraging to note that a substantial amount of money is allocated in the budget of the Community Development Projects and the National Extension Service Blocks for securing necessary Audio-Visual equipment and materials. While equipment is essential, the possession of it does not ensure effective use. Therefore, the need for training in the use of A-V equipment and materials has also been recognized. Since the newly recruited village workers have to be trained in the philosophy and practice of Extension, almost simultaneously with the opening of the Community Projects, a number of Extension Training Centers were established in different parts of India for the purpose of training *Gram Sewaks* (Village Workers). It is in these training centers that the use of Audio-Visual aids in Extension begins.

A-V AIDS IN EXTENSION TRAINING

In these centers a large number of village workers are being trained in relatively short periods. That is one of the major reasons for making full use of A-V aids in the training classes. It is universally recognized that the use of audio-visual aids in teaching

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cuts down the time taken for imparting information. In addition, it has also been found that the use of different audio-visual methods in teaching the same subject makes it possible for the student to retain more of the information that has been given. Thirdly, certain ideas cannot be passed on by mere words but can only be done through the support of media such as posters and charts. All of these make it extremely necessary that audio-visual aids should be used in Extension training.

METHOD OF SELECTION OF MEDIUM

When it is decided to use audio-visual aids in training, one has to have some basis by which to decide which of the aids are applicable or can be successfully employed. The following points should be considered in the selection of a particular medium:

1. The size of the class. If the class is up to 30 members media effective for small groups can be successfully used, as for instance, flashcards. If the group is larger than 30 the same media cannot be used as effectively.

2. The time available for presenting the subject. This would indicate the number of periods assigned as well as the duration of each period. The teacher concerned will have to decide the type of medium to be used in relation to the time at his disposal. For instance, if a teacher is assigned a one-hour period on the subject of Community Projects in India, perhaps the best method would be to have a series of charts illustrating the different aspects of Community Projects rather than a movie of 40 minutes duration, because in the former he can explain as he presents the information and also answer questions. In the case of the film the trainee has to wait until it is over to raise questions and might forget several questions which occurred to him during the screening of the film.

3. Funds available for audio-visual aids in teaching. In many cases this might be the criterion for deciding as to what type of medium should be used. If no funds are available the teacher can use the black board and chalk and other non-projected aids. However, in view of the increasing importance of audio-visual aids in teaching, most institutions now provide a budget for the preparation of such materials. In this connection it is worth mentioning that there are two categories of materials which can be used depending on the availability of funds:

(*a*) those which can be prepared by the teacher at the institute. These materials are not likely to be costly. The aim of each teacher should be to prepare some of his own materials.

(*b*) materials which are to be prepared by the artist or the photographer or various experts in different media outside the institution. Naturally, such materials are bound to be more expensive.

4. Nature of information to be imparted. Although any

information can be imparted through audio-visual aids, some subjects will need a good deal of explanation along with the audio-visual aids. Basic principles, ideas, and facts should be presented verbally using audio-visual aids in support of the verbal presentation. In no case can ideas be presented entirely by passing out audio-visual aids without any explanation. While the above is true, certain types of information such as description of processes, steps to be followed in certain field operations, etc., can be best presented with the appropriate aids with a limited amount of explanation.

5. The language of the trainees. If the class consists of trainees from different language areas and do not have a common language, materials using more pictures than words would be a very valuable medium for communicating the idea correctly and effectively. This will also cut down the necessity for repeating statements in different languages so that all the trainees get the basic ideas being presented.

6. Availability of equipment, electricity and other facilities. In places where there is no equipment for projecting, media requiring the need of such equipment obviously cannot be used. The teacher concerned will, therefore, have to limit his media to those which do not need such equipment. A resourceful teacher can indeed find several effective media for which costly equipment is not necessary.

On the basis of selection as discussed above, the following methods lend themselves very favourably for use in Extension training as aids to effective education.

CLASSROOM MATERIALS

1. Photographs.
2. Charts and Maps.
3. Illustrated outline notes.
4. Models.
   (*a*) still models.
   (*b*) "working" or "action" models.
5. Filmstrips and Slides.
6. Movies.
7. Recordings of group discussions held in the village.

FIELD MATERIALS

1. Demonstrations.
   (*a*) method demonstration.
   (*b*) result demonstration.
2. Trainees' Participation in Village Conference, mela, recreational and cultural programmes.
3. Educational tours to centers of particular interest such as artificial insemination centers, poultry farms, co-operative marketing depots.

6

PHOTOGRAPHS

Every teacher knows the importance of pictures to convey ideas, but unfortunately few of them use pictures in their classes. The teacher could prepare sets of pictures to illustrate different topics. A set of photographs of *desi* and improved agricultural implements will be far more effective than pages of description of the same implements. One very good use of photographs is where an accurate record has to be made of a happening which might be difficult to repeat, as for instance, the crops in a result demonstration which cannot be maintained in the field after the season is over. If the demonstration has been very successful and if the teacher wishes to "show" the result to future trainees, the best thing he can do is to take photographs. If funds are available and if the training center can arrange for the use of a slide projector the teacher should take the photograph on colour-film (35 mm. kodachrome type). Otherwise good black-and-white photographs enlarged to suitable size are very satisfactory. (see illustration)

CHARTS AND MAPS

Charts are valuable for showing any operation in which there are several steps. The use of a green manure crop to enrich the soil is a good example of this. A chart showing the following steps will be a very effective medium for the Agronomy teacher to teach green manuring to the trainees.

1. Showing the seeds of a green manure crop, like Sunnhemp.
2. Stand of the crop after several weeks.
3. Method of knocking the plants down.
4. Ploughing under the knocked-down plants with a soil-inverting plough.

ILLUSTRATED OUTLINE NOTES

In our experience at the Allahabad Agricultural Institute with the training of Extension workers, it has been found that mimeographed outline notes on the topics to be discussed help a good deal in covering more subject matter in one period than without the notes. These notes are prepared in such a way that by themselves they do not convey all what the teacher would like to say. But when they are used with a discussion or a presentation by the teacher they improve teaching. Some of these notes are illustrated in line drawings to show the methods of doing something, such as the different kinds of seating arrangements in conducting a group discussion in a village, or the method of cutting cloth to make a blouse.

MODELS

These have been used for a very long time as a visual aid in teaching. The special advantage of models is that they "show" much

more than a photograph. Secondly, the structure of internal organs of animals or plants can be shown by models. As a teaching medium models of the human eye or heart, which can be opened to show the internal parts, are the next best thing to the dissection of the actual specimens. However, good models are somewhat expensive especially if they are "working" models.

FILMSTRIPS AND SLIDES

These are good media but they can be used only with a projector. The filmstrips are made on 35 mm. films and can have as many frames as needed to illustrate any given topic. The prime advantage of filmstrips and slides over movies is that they cost comparatively less to produce and the machine in which they are projected costs much less than a movie projector. The second advantage is that each picture can be kept on the screen as long as the teacher wants to complete the explanation or to answer the questions on the picture by the trainees. The supply of filmstrips or slides needed in Extension training is practically unlimited.

16 MM. FILM

Educational films dealing with agriculture, animal husbandry and other subjects are very useful in Extension Training. Two films on Extension Training sponsored by the Ford Foundation and distributed by the Government of India are valuable in making the trainees see and recognize rural problems which need solution. They also inculcate a spirit of service in the trainees.

RECORDINGS

In those training centers where there are facilities for recording talks, plays, dramas, and other educational programmes, the tape recorder is an effective tool. A successful group discussion conducted by a trainee can be recorded and played back for subsequent groups of trainees. Recorded talks by experts who are not readily available can be used in different classes.

FIELD MATERIALS

This term is used to denote all methods which are applicable to field conditions. An effective method in this category is the field demonstration. As stated above there are two kinds of demonstrations—Method demonstration and Result demonstration. In method demonstration the objective is to show "how to do" a thing. If the Japanese method of rice cultivation is to be taught, perhaps the most important method would be a field demonstration. This needs a good deal of planning and preparation to be successful. The demonstration can be held in a villager's field or on the farm attached to the training center.

In preparing for a demonstration, the following points should be kept in mind:

1. Equipment and materials needed. These should be arranged well in advance to avoid last-minute difficulties due to the lack of them. Equipment which need to be tested should be tested at least an hour or so before the time for the demonstration so that alternate arrangements can be made if it fails to work.

2. A step by step plan of the demonstration should be written down on paper and should be followed.

3. Keep all the materials necessary on one side in the order in which they are to be used. After using each one, move it to the other side, to make the next one to be used easily accessible.

4. The person conducting the demonstration should give a brief outline of it before he starts so that the listeners will know what is going to happen in the demonstration.

At the end of the method demonstration there should be an opportunity for discussion so that if any point is not clear to the trainees they may get an opportunity to clarify those.

Result demonstration: This is conducted generally to show the effect of two or more kinds of treatments as, for instance, the effect of different kinds of fertilizers on a particular crop. This can also be used to bring out the effect of a changed practice as compared to the older method. Since one of the objectives of Extension is to bring about a change in practice, result demonstration is an extremely valuable tool for this purpose. This also needs careful planning and timely operations especially in agricultural practices to get the best result.

USE OF AUDIO-VISUAL AIDS FOR EXTENSION WORK IN THE VILLAGES

In general the A-V aids used in Extension training can also be used effectively in the villages. In addition to those mentioned earlier there are several other media which are particularly adapted for village use. In the selection of such aids two factors should be noted. These are:

1. The type of audience, namely, whether it is a mixed audience consisting of children, women, men or old people. It would be very difficult to use a single medium for a mixed audience consisting of different age groups, except when the medium is used mainly for entertainment. However, it is not practicable for the Extension worker to isolate different age groups in his meetings. Therefore, he shall have to decide as to which medium should be used, based on the composition of the major group to which he is aiming his presentation. For example, if he is giving a talk on green manuring and wishes to use certain audio-visual aids in support of his talk and if he knows that the group is going to be a mixed one consisting

of some women and some children he may still prepare medium for an audience consisting entirely of village farmers; or, if the worker is planning a meeting to promote a smokeless chulah in the homes he may prepare his materials keeping in mind the women who will be attending the meeting and presenting the ideas from their point of view.

2. Whether the audience has been accustomed to seeing audio-visual aids or not. Villagers who have had an opportunity to see printed pictures might not have much difficulty in grasping the idea presented in a simple poster. But the same audience might not catch the ideas presented through a series of flashcards as quickly and as effectively in the beginning because they are not accustomed to such a presentation. However, in course of time a skilful Extension worker can make use of any kind of medium with good results.

In general the following audio-visual aids are very effective in extension work in the villages:-

Non-projected Visual Aids

1. Photographs. 2. Posters. 3. Flashcards. 4. Flannelgraphs 5. Models. 6. Wall stencils. 7. Wall newspapers.

Projected Audio-Visual Aids

1. Filmstrips. 2. Slides. 3. Movies.

Other Media

1. Dramas. 2. Puppet plays. 3. Bhajans and Kirtans. 4. Radio. As the methods of preparation and use of these audio-visual aids are discussed elsewhere in this book, they are not included in this chapter. However, there are certain special features to be noted in using them in the villages:

NON-PROJECTED VISUAL AIDS

If photographs are used they should be sufficiently large so that a big group will be able to see at the same time. In posters it is extremely desirable to present only one idea instead of trying to present two or three ideas. Expression of ideas through pictures rather than through words should be the guiding principle in preparing a poster. Since this is very difficult it is always advisable to pre-test a poster in the villages before printing it in large quantities. Flashcards are very useful for groups of up to about 25 people. A skilful Extension worker should be able to rivet the attention of his audience to the story being presented with the aid of flashcards. This is possible because the people are eager to know what comes after the card which is being shown to them. In order to avoid distractions, as far as possible, the dress of persons pictured in the flashcards should be like those of the people in the area where these are to be shown. Wall stencils are being very effectively used in extension projects

especially to promote meaningful slogans. The stencils are cut out and the words are stencilled on the walls of village houses or other places where they can be prominently displayed. In order to give opportunity for expression of the creative ideas of village people the Allahabad Project has introduced the wall newspaper in a number of villages. It consists of a hard-board approximately 4′ x 3′. The right-hand side of it is plain and is painted black or green over which villagers can write whatever they like. The left-hand half of the board has holes drilled into it in rows which are 1″ apart. Posters, weekly newspapers, notices, etc., are fixed on this side of the wall newspaper by inserting a small piece of pointed stick into the hole through the paper to be attached. The illustration given below is that of a typical wall newspaper in one of the project villages. To give partial shelter to these wall newspapers they are usually hung on the wall under the eaves of village houses.

PROJECTED AUDIO-VISUAL AIDS

As projected aids need equipment and as the filmstrip, slides, movie films are also expensive such media cannot be used without Government aid or comparatively large amount of funds from other sources. In Extension work filmstrips are extremely valuable because they can be projected on projectors using the kerosene pressure lamps. Movies are mainly for entertainment and less for education, even though they invariably attract large crowds of village people.

OTHER MEDIA

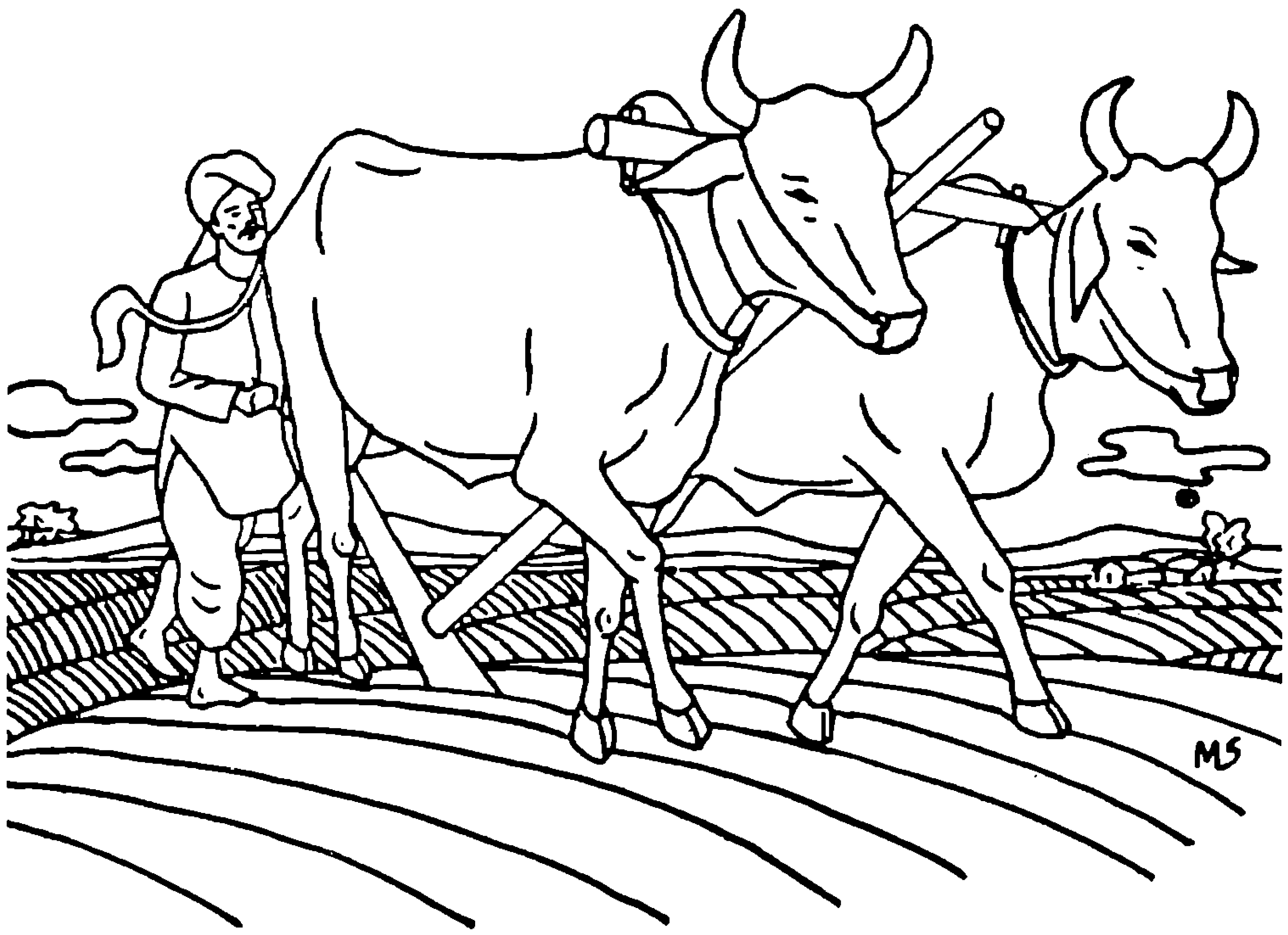
Dramas, puppet plays, bhajans and kirtans are well known in the villages and can be very easily adapted for extension work. As far as possible in these media village talent should be used. Most of the radio stations in this country have daily programmes for rural people. These could be used for promoting Extension work if there is greater co-operation between the staff of the radio stations and Extension workers in the field.

SOURCES OF AUDIO-VISUAL AIDS FOR EXTENSION WORK IN INDIA

At present there are only very few centers producing audio-visual aids for Extension. The Ministry of Food and Agriculture, Government of India, with the aid of the T.C.M. are producing different kinds of audio-visual aids. The Ministry of Health, Government of India, is producing posters and other materials for public health extension. The Agriculture Department of various State Governments are producing some materials for agricultural extension. Similarly other departments are producing some materials which can be used by Extension workers.

The Extension Project of the Allahabad Agricultural Institute is producing posters, flashcards, filmstrips, booklets and hand puppets mainly for Extension work. As Extension work increases in the country there will be need for more production centers. However, one should not minimize the possibility of each Extension worker producing many materials by himself.

Extension is education and any aid which helps in that process of education should not be neglected. Many Extension workers are already using such aids and it will be a great service to the country if there is a pooling of ideas in the production and use of audio-visual aids in agricultural Extension in India.



Chapter 12

AUDIO-VISUAL AIDS IN WORSHIP

DONALD E. RUGH[1]

THE use of Audio-Visual Aids in worship is an innovation which is contrary to the tradition of the majority of Protestant Churches in India. During the Protestant Reformation in Europe radical changes in worship were made. At Zurich, Switzerland, an order of worship was introduced from which the organ, choir and even congregational singing were banished. The Puritans of England in their attempt to break away from the medieval church fell back on the customs of the Apostolic Age. When transplanted to the continent of America the Puritans built their "meeting houses" as plain as barns eliminating stained glass windows, musical instruments, and all forms of ceremonial worship. Exhortation through the sermon was given the central place.

The missions stemming from America were all influenced by the Puritan tradition and the Methodists, Baptists and Presbyterians along with the Quakers made little use of ceremonial worship as they organized the Church in India.

LINGERING DOUBTS

Although the churches are no longer so much interested in expelling forms of Catholicism as they were 300 years ago, there is still often found a resistance against introducing new forms which detract from the sermon as the central part of the service. When it was suggested in a certain church that one evening of Holy Week be devoted to showing pictures of the last week of Christ's earthly ministry, the minister in charge of arrangements said, "Of course, sufficient time would be left for a sermon."

There are many pastors and leaders who have not yet learned the value of combining the spoken word with the visualized scene. In my younger days I attended Epworth League for at least eight years, yet I can recall what a leader said in only one service. He chose for his text the words on a stained glass window in the room in which we met. There was a vine with a bunch of grapes pictured

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in the window and the words, "I am the vine and ye are the branches" He brought out the thought that we are united in Christian fellowship like a bunch of grapes but we must keep spreading out like a vine and grow if we are to be fruitful.

JESUS WAS A MASTER

Jesus was a master in the audio-visual method. As the people sat in the open, perhaps on the border of a wheat field with bushes, rocks and paths in full view He gave them the parable of the sower in an unforgettable manner. All the parables associated spiritual and intangible lessons with visible symbols.

We cannot always have a wheat field nor a stained glass window to illustrate our talks but it is possible in small groups to use such things as flannelgraph or large flat pictures and in larger groups to use projected pictures.

Lantern slides were introduced in the churches at the turn of this century and moving pictures after 1920, yet their use has often been more as a crowd booster than as an aid to worship. Still most of the films used in churches are educational, entertaining or for missionary propaganda. The "King of Kings" has had wide circulation and great effect and there are several films produced by Arthur Rank· in sound which have a real message in them (available in National Christian Council Library). They can be used for inspirational programmes where they become the central part of the service.

AVAILABLE MATERIAL

The Cathedral or Church-Craft Co. have produced numerous slides and filmstrips on mostly every subject in the Bible. Many of these are available in India through the National Christian Council and the "Methodist Central of Christ" by Elsie Anna Wood and the paintings of Coping on New Testament subjects can yield excellent materials for "worship aids".

It is the easiest thing in the world to illustrate a Scripture lesson with any of the above-mentioned sets, and it is also very simple to select a picture for the central theme of a talk.

PRACTICAL PROBLEMS

However, if pictures are to be projected satisfactorily there are a lot of headaches for the projectionist which will perhaps be dealt with at more length in other chapters of this book. The main thing which must be said here is that the projectionist must be so familiar with the handling of his machine and the slides or strips that he can throw them on the screen at the proper moment in the proper focus and in the proper position (not upside down).

As one progresses with the building up of equipment and familiarity with its use it is possible and profitable to use recorded music or synchronized speeches along with filmstrips and also to use the

microphone so that the leader speaks without putting himself in front of the group.

The darkening of the room is often a problem, but my experience is that throughout most of the year projected services can be held outside more effectively than inside. For some reason the average person thinks that they are helping the situation by closing the doors and windows even on a dark evening. I have suffered more in using projected pictures from lack of ventilation than from too much light. With a beaded screen in a position where the light does not strike it from the front it is amazing how light the room can be and still get satisfactory results, if the projector bulb is sufficiently strong.

There is really a great advantage to projecting pictures as the centre of interest for a worship service. For one thing the distractions around us are not as visible, and secondly it holds the attention of the small children who are often a source of disturbance. It becomes possible for the leader working in close harmony with the projectionists to capture a mood that will transport the worshippers from their present surroundings to a place perhaps removed by thousands of miles and many centuries or to a thought which transcends the bounds of this earth. When this becomes possible then the "Aids" have become really an aid.

The editor of the Church Department in the *Educational Screen* has stated, "There is no such thing as Visual Education. What the church is trying to give the child, youth and adults is the desire and ability to lead a certain kind of life, and in the accomplishment of this great and noble work many kinds of material and methods will be used."

Rogers and Veith in *Visual Aids in the Church* say, "The primary question in the use of visual material must always be, 'What help will they offer in achieving the experience of worship for all the members of the worshipping group?' " In worship services we must build our programme around the needs of the group for spiritual guidance rather than around the film library.

WHICH AIDS?

For those who wish to make more extensive use of projected materials than the film libraries allow, the epidioscope or delinioscope is the best answer. With this flat picture may be shown from any source or even a passage of the Bible can be put before the group so that they can more easily recall it. The words of hymns may also be typed and projected or used directly out of the book. There are several English hymns now on filmstrips and the production of the Christmas Carols on coloured slides by Dr. Ebright and Mr. Reed has been a real step forward toward making Audio-Visual Aids in worship more practical. As time goes on it is hoped and

expected that more and more of such material will become available in each language area and that everyone will co-operate in giving it wide publicity and distribution.

EXAMPLES OF WORSHIP SERVICES

The following are examples of worship services which can be used effectively with visual aids. They are not presented for complete adoption but as suggestive methods for using visual aids under different circumstances.

(*a*) A Service for General Use

Call to worship (Picture of natural beauty in colour on screen):
"The earth is the Lord's and the fulness thereof:
The world and they that dwell therein.
O worship the Lord in the beauty of holiness."
Hymn "For the Beauty of the Earth" (Filmstrip, RG 77, N.C.C. Library).
Scripture reading—Psalm 8:
Verses 1, 2 (picture of natural beauty).
Verse 3 (picture of sky—stars, if possible).
Verses 4-6 (picture of people).
Verses 7-9 (pastoral scene).

PRAYER

Moving pictures "The Vale of Kashmir" colour (El 29, 30, N.C.C. Library). Accompanied by playing of records—no comments are necessary.

Hymn: "Fairest Lord Jesus" (Filmstrip, R.G. 78, N.C.C. Library).

CLOSING PRAYER

"We thank thee, our Father, for Thy Thoughtfulness in making the world so wondrous fair. We praise Thee for the glory of the morning, the joys of noon-day and the beauty of sunset. Open our eyes that we may become more sensitive to beauty in its various forms. Grant that the glories of nature may remind us of Thee, who art the Creator and Ruler of all nature. Touch our hearts that this love for Thy creation may lead us to a deeper love for Thee and Thy Son in Whose name we pray." *Amen.*

(*b*) A Hindustani Service for the Christmas Season

Introduction: "Bara Din Gane Ka Waqt Hai."
(Filmstrip of Christmas Carols produced by Ebright and Reed).
(For best use in such a service they should be in slide binders).
Sing: "Suno! Falki Fauj Sharif" (Hark the Herald Angels Sing).
"Ulfat Ajid" (Silent Night).

Prayer.

"The birth of Jesus" (Church-Craft slide set No. 6). (Illustrates Luke 2: 1-20 with 14 coloured slides).

Sing: "Aya hai Yesu, Aya hai—"

"Ham tin badshah" (We Three Kings).

"The Wisemen find Jesus" (Church-Craft slide set No. 6). (Illustrates Matt. 2: 1-12 in 9 slides).

Prayer.

Sing: "Khush ho, Khudawand aya hai". (Joy to the world the Lord has come).

(c) A Service for Holy Week

Scripture sentences:

"Though He was rich, yet for your sakes He became poor, that ye through His poverty might be rich." 2 Cor. 8: 9.

"Who for the joy that was set before Him endured the cross, despising the shame, and is set down on the right hand of God" Heb. 12: 2.

Hymn: "Jesus Keep Me Near The Cross" (picturol).

Scripture: Mark 15: 6-15, "Christ before Pilate" (Picture No. 6 "Life of Christ" Roll No. 4—Bray).

Prayer: "My Lord Jesus, it was not Pilate, no it was my sins that condemned Thee. So often I have listened to the crying of the mob and done that which I knew was wrong in Thine eyes. I repent with my whole heart for having offended Thee. Forgive me most merciful Jesus"

Scripture: John 19: 16, 17, "Christ bearing the cross" (Picture No. 10).

Quartet: "Must Jesus bear the cross alone?"

Prayer: "My Lord Jesus, it was for me that Thou didst bear the Cross. Too often I have fretted under the load of my small cross forgetting what Thou hast done for me. Give me the help I need to carry my cross with patience and give me strength to be a worthy disciple. I repent with my whole heart for having been impatient and weak. Forgive me, most gracious Jesus."

Scripture: Mark 15: 21, "Thy Cyrene helps" (Picture No. 10).

Poem: "Simon the Cyrene speaks", Christ and the Fine Arts, p. 402.

Prayer: "My Lord Jesus, may it not be necessary for others to compel me to help Thee as Simon was compelled. Give me a consciousness of the needs of others and a sensitiveness to Thy Holy Will. Forgive me for having been blind to Thy need and deaf to Thy cry for help. I repent with my whole heart for having been so slack and slow. Forgive me, most compassionate Jesus."

Scripture: Mark 15: 22-32, "Placed on the cross" (Picture No. 13).

Quartet: "Beneath the cross of Jesus."

Prayer: "My Lord Jesus, the suffering which Thou didst bear for me is more than I can comprehend. Yet like the soldiers who gambled at Thy feet and as the crowd that called out in mockery, I have been unconscious of Thy grief and of the meaning of Thy sacrifice. Forgive me for having failed to understand and sympathize. I repent with my whole heart for having been so cold and stupid. Forgive me, most understanding Jesus."

Scripture: Mark 15: 33-39, "Death on the cross" (Picture No. 14).

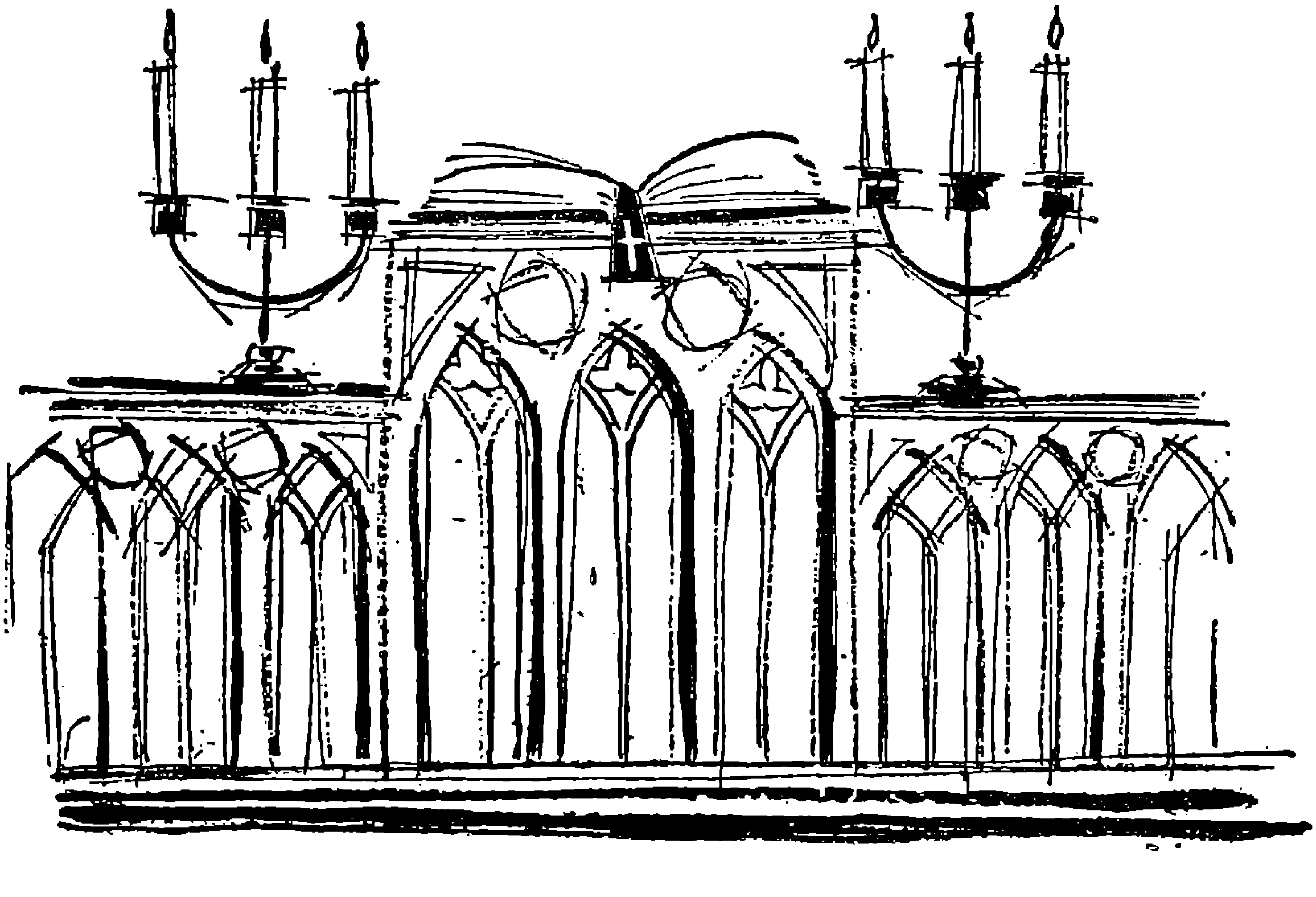
Quartet: "God so loved the world."

Prayer: "My Lord Jesus, I have merited by my own sins to die and yet Thou hast gone through the valley of the shadow for me. I have acted and spoken as if by my own cleverness and wit I could overcome all obstacles. Yet there is no wisdom in the world that can overcome the obstacle of death except Thy divine plan. Forgive me for having been so self-willed and unwilling to yield. I repent with my whole heart for having been so selfish and stubborn. Forgive me, most loving Jesus."

Scripture: Mark 15: 42-47, "Placing in the Tomb" (Picture No. 16).

Hymn: "When I survey the wondrous cross" (Picturol).

Benediction.



Chapter 13

POSTERS

ANNE HANSEN[1]
ISMENA R. WARREN[2]
THEODORE ESSEBAGGERS[3]

WHAT is a poster? They are all around us: in the railway station urging travellers to go to Kashmir; the bank advising travel-wise people to "Fly Air-India"; and in the post office is the colorful admonition, "Coughing Spreads T.B"

Schools, churches, business and government departments use the poster to "hammer home" an idea. Every poster has these characteristics in common: they are designed to catch the eye of the passer-by, hold his attention, impress on him an idea, fact or image that he will remember. Someday he will fly "Air-India" or go to Kashmir.

In order to call to the passer-by, "Look at me", the poster should be clear in printing and bold in lettering. If there is lettering it should be brief and immediately interpreted. People seldom stop to "consider" posters. The message must be read at a glance.

Good advertising is based on psychological research. Modern posters are the outcome of much thinking—as well as years of experience on the part of the organizers of the commercial world.

It is only gradually being realized to the full that goods do not sell themselves, that manufacturing, however efficient, takes us only half way, that selling is one of the greatest constructive factors in commerce, and that good advertising is the best impetus for sales that human ingenuity can devise.

The advertising man should be tremendously proud of his vocation because his efforts more than those of any other individual must be associated with a return to prosperity. When I say "advertising man" I mean those who are employed in publicity work.

Every nation has come to realize this fact—one result of this is amount of money that each nation is spending on propaganda and mass communication today.

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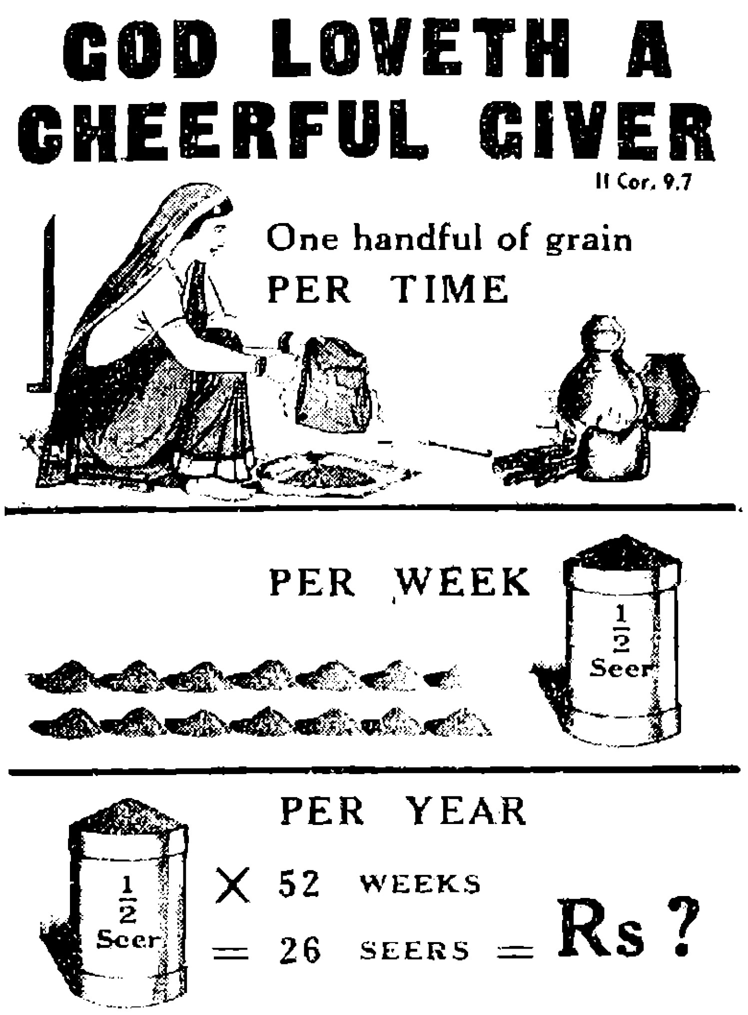
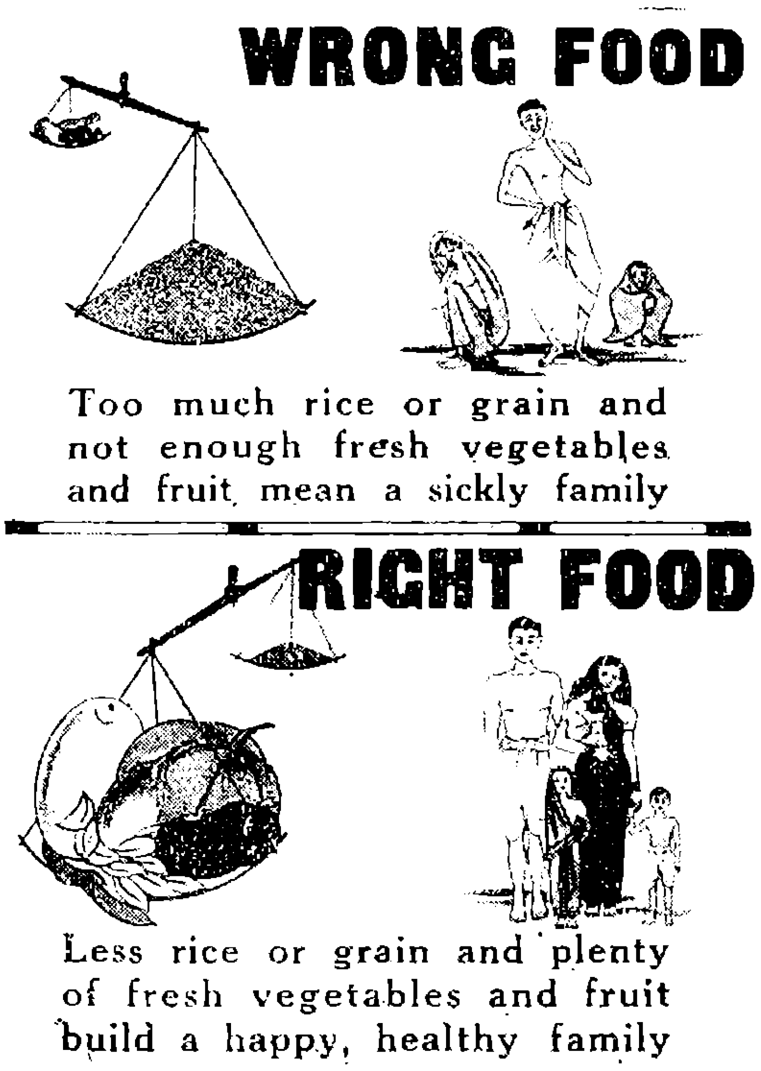
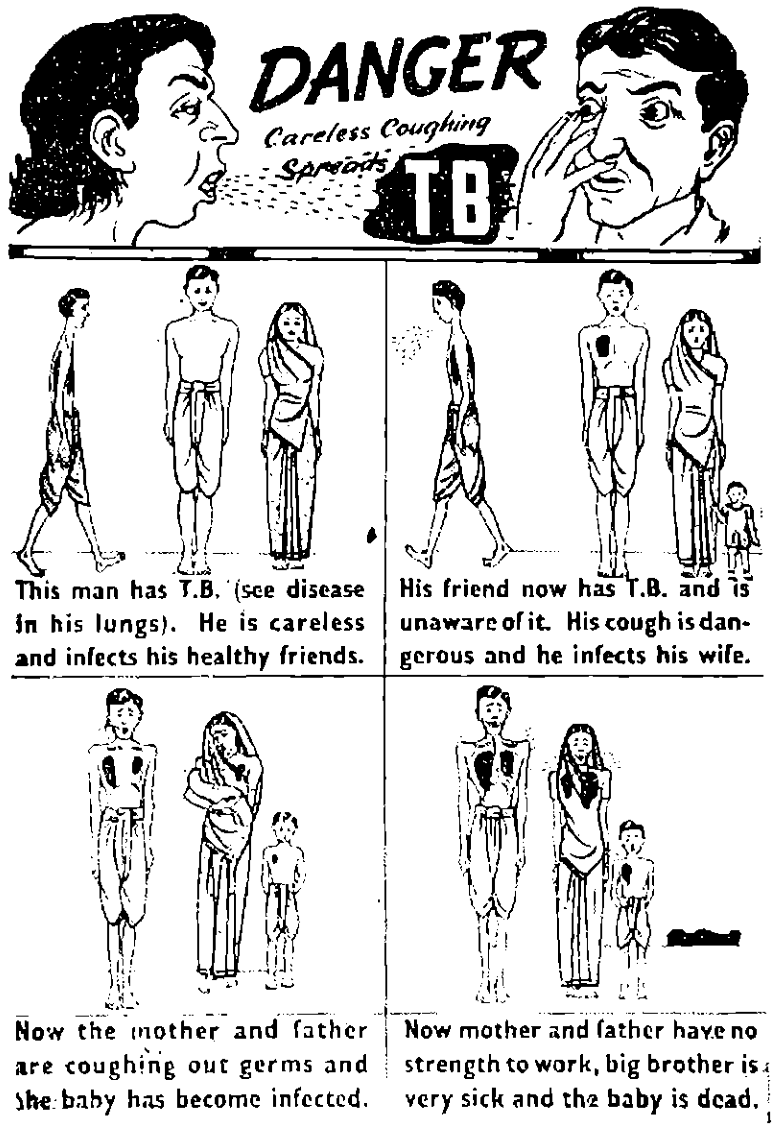
[1] Miss Anne J. Hansen, B.A., Cumbum, Kurnool District, is Chairman of the Andhra Regional Christian Council Audio-Visual Aids Committee.

[2] Miss Ismena R. Warren, Madras, is a missionary artist on the staff of the Christian Literature Society.

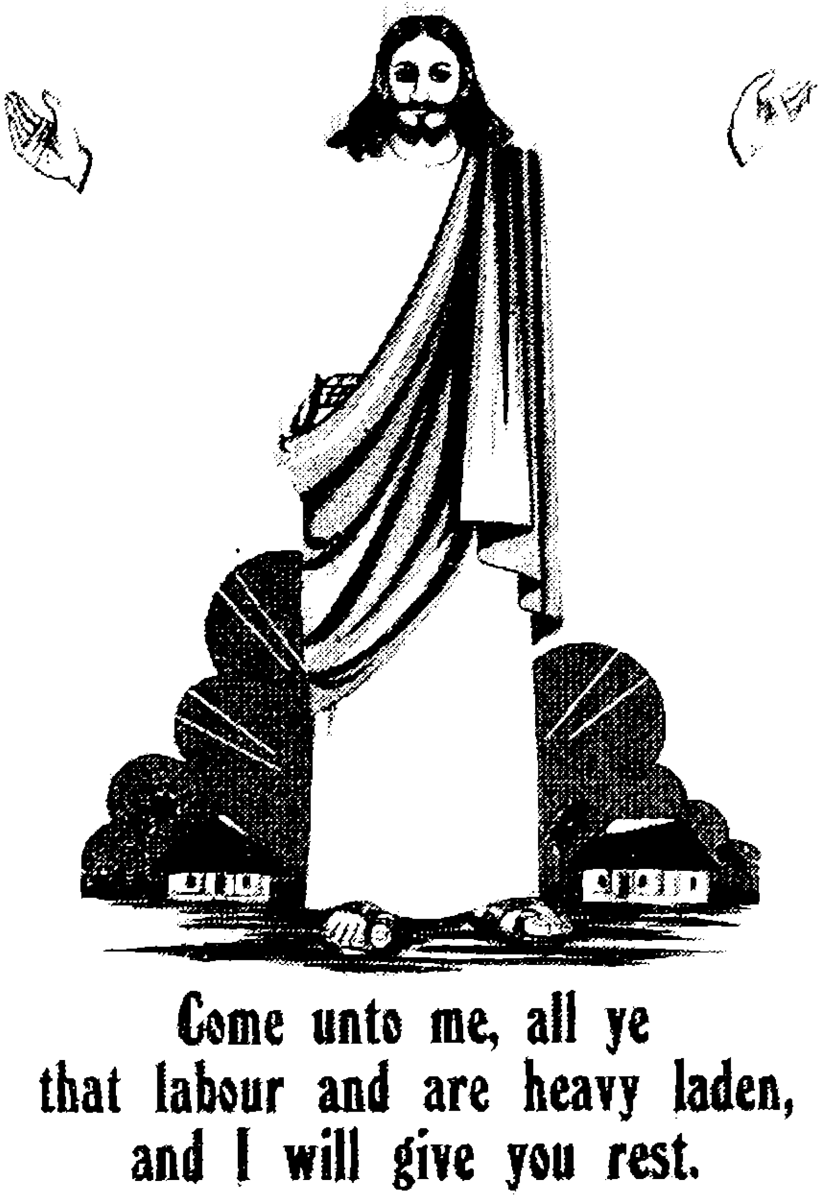
[3] Rev. Theodore Essebaggers, B.A., M.A., S.T.B., is in charge of literature and Audio-Visual Aids, American Evangelical Mission, Raipur, M.P.

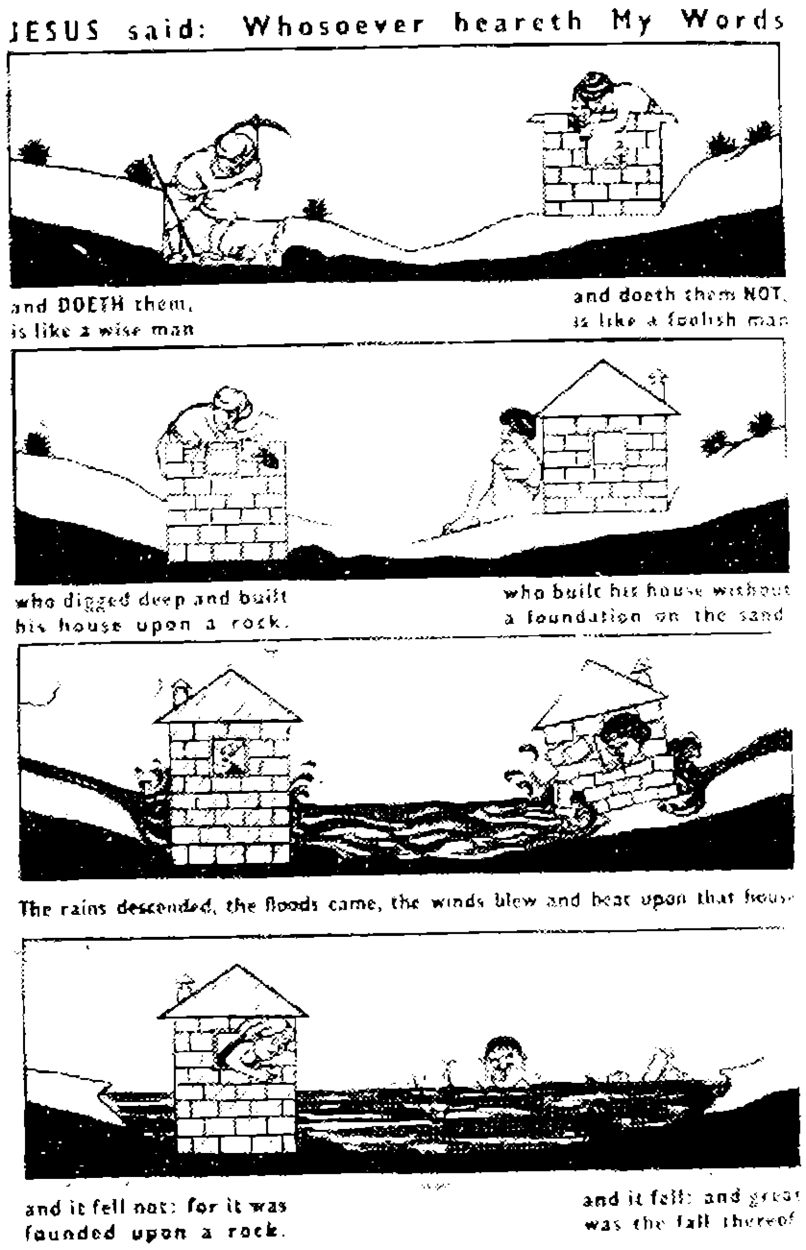


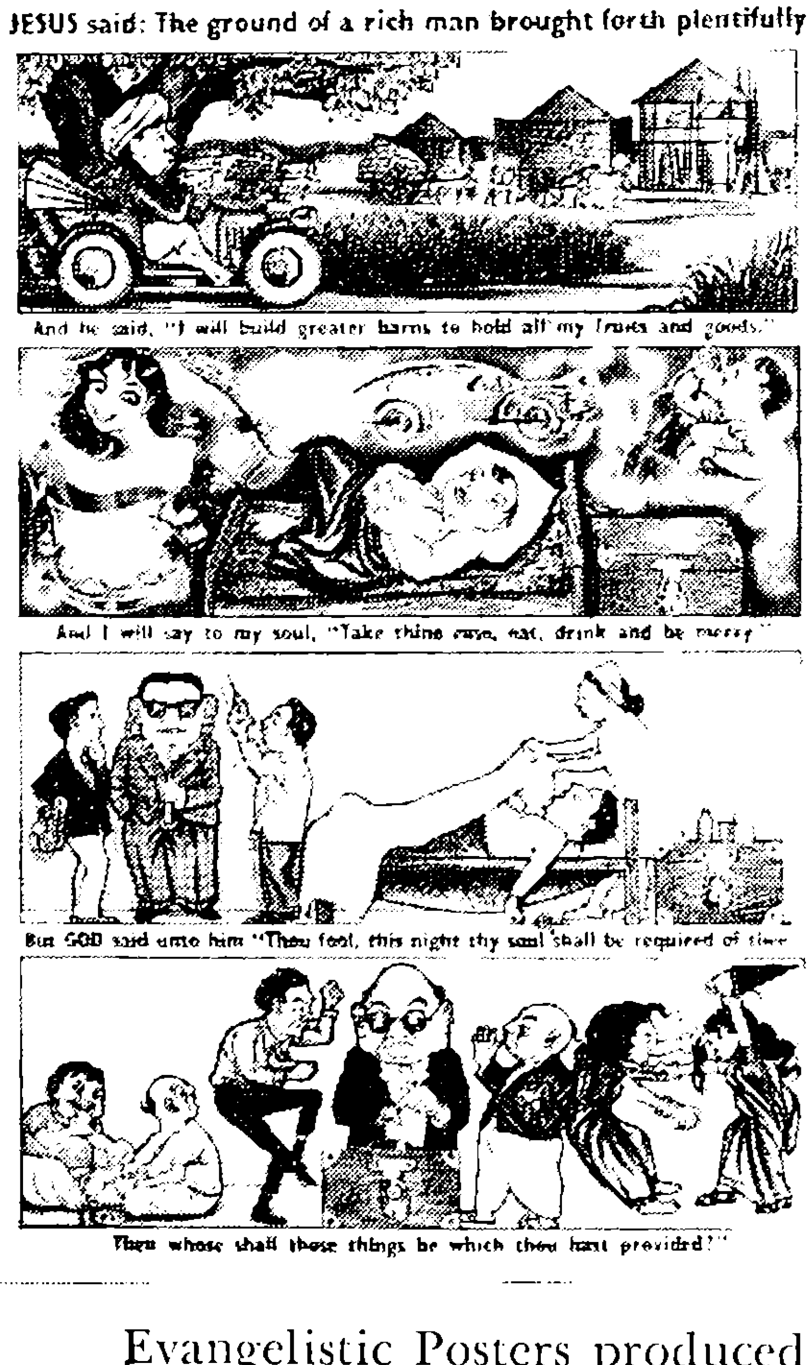


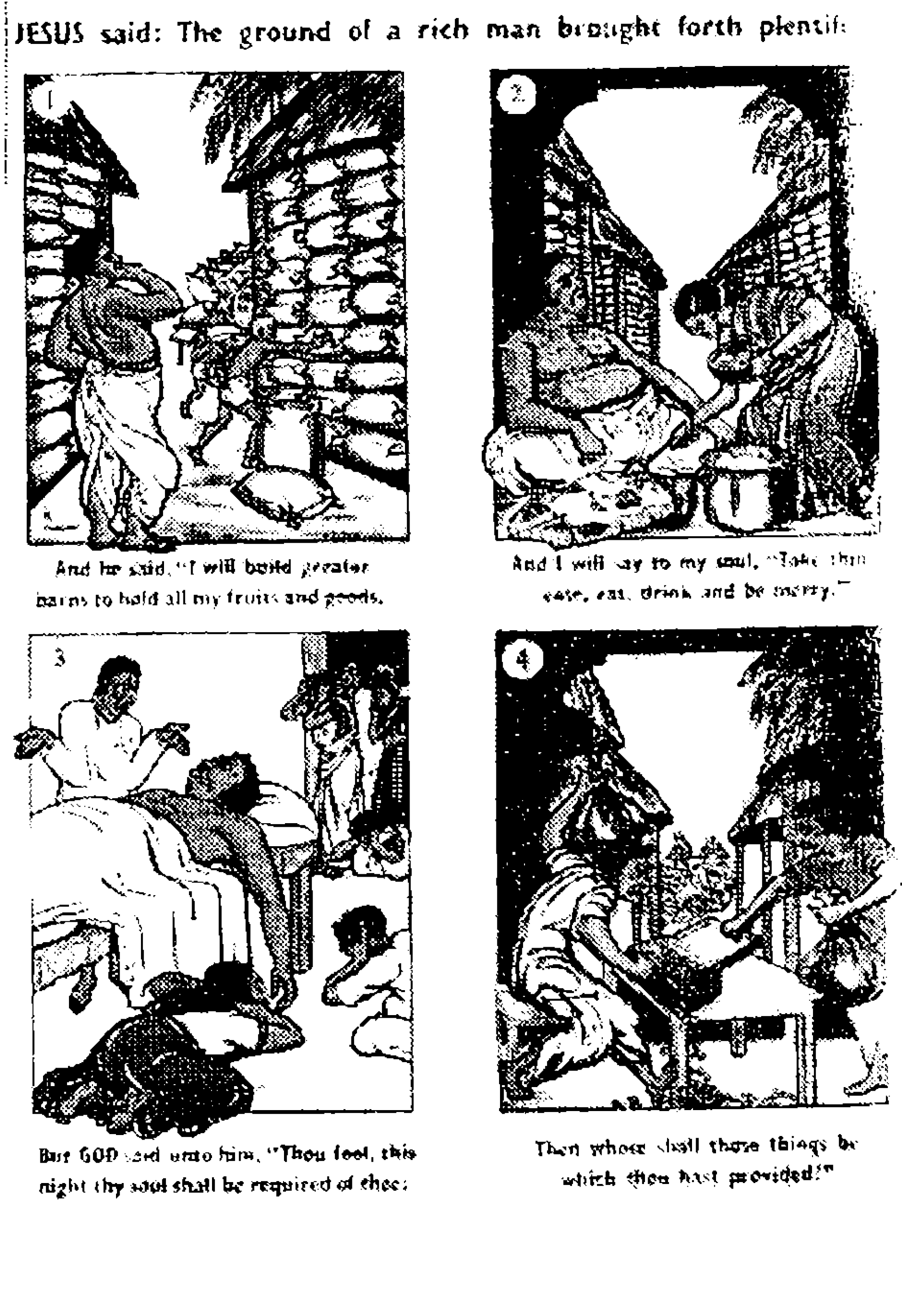


Health and Stewardship Posters produced by the C.L.S. Press as a result of the A-VA Poster Conference.









Evangelistic Posters produced by the C.L.S. Press, Madras, as a result of the A-VA Poster Conference.

We see some of it here in India in the American and British Information Services. Russia is spending a tremendous amount of money in the spreading of Communist propaganda.

This is all linked up with posters and advertising (as propaganda is advertising) so let us get back to posters.

What does good advertising consist of? I would say catching the interest of the individual in the shortest possible space of time and not only catching it but holding it.

A return to the obvious has its own value. It is a reminder that advertising is dealing with simple human nature, that it must not over-reach itself by losing contact with the common interests of all. This, however, has been carried to the pitch of exaggeration. The new realism of outlook was accompanied for a while by a new vogue for sensationalism. The scare type of advertisement acquired a sinister prominence. It is to the credit of business that this attack upon the emotions of the public has lost rather than gained ground.

There must be response on the part of the individual. This is true of all forms of art whether it is music, drama, literature or painting—otherwise it is not true art. Something within us must say "That's true."

Music appeals to almost all humanity in greater or lesser degree according to the individual and the quality of mind and education and of course the quality of music.

Sentimental music appeals to a larger number of people than almost any other type apart from modern jazz.

Classical art. The same thing applies here as the appeal is to the higher mentality and can reach a smaller public. Therefore you must realize the fact that Poster work and Commercial Art must be of a type that can find a response in almost everybody. We must not, however, despise this type of art as it can be built on a very good foundation and need not be in any way decayed.

If we study the history of commercial art, we see how in the last 50 years it has progressed. We see also how it need not jar other most sensitive and cultured minds. There are so many things to remember in good Poster making. Here are a few ideas on the subject.

(*a*) A concise and striking slogan.

(*b*) Good bold lettering.

(*c*) As few colours as possible.

(*d*) Good spacing in both design and lettering.

(*e*) Direct appeal to the individual and to one particular sense of that individual.

(*a*) Concise and striking slogan. In these days of speed and more speed, the man in the street or individual in passing, there is no time to stop and read unless he feels that it is worth his while.

We must make it seem as if it is in need of whatever we are advertising.

(*b*) Good bold lettering. In whatever the language the Poster will be, we must know the form that the ancient classic lettering took. In the case of English, Roman lettering will give classic example to be referred to in the Trojan sculpture. Good classic examples of this type of lettering are often found in modern posters. The letters should be well formed and not distorted by either elongating or expending them to any great extent. The lettering should be the integral part of the design and not just put on as an after thought. The weight is often best placed at the top of the Poster as in looking at things from a distance the tendency is for the lines to appear to drop further down the pages or paper.

Another aspect of the realistic outlook is a keener sense of the utilitarian values of design. In this respect advertising has been evidently influenced by the example of architects and others imbued with the modern principle of "Fitness to purpose." So-called "functionalism" has become one of the mainstays of many forms of design. In effect this means that any object is the better for being designed in the simplest series of external surfaces possible and with a close visual relation with fundamental ideas. The stream-lined train is a case in point. A functional window display is one where useless decoration is eliminated and the goods themselves provide the major part of the design attraction. Most redesigned packages show this tendency strongly. Within its own limits packaging displays much more of an architectural, i.e., dimensional, than decorative character. The designer of packages seems to share the modern architect's distaste for or inability to conceive ornament.

In general American magazine advertising is simple and straight forward in design. There is an illustration and there is something to read. A photograph and a story—but both are usually chosen with such an eye to dramatic effect that nothing more is required than utter directness of layout.

One thing to be avoided is any horizontal line running across the page dividing the poster into two equal parts.

One reason for few colours is economy in printing as every colour means a further run through the machine and also the fact that the rollers of the printing machine have to be cleaned up. This entails hours of work and therefore added expense.

As Posters are made to be seen from the other side of the street, it stands to reason that the designs should be very bold. This calls for good drawing, which in itself demands years of study. Because of the present demand for good posters and the recognition of their value in the commercial world, some of the best artists in modern times have designed posters for large commercial firms, railways and proper agencies who they pay enormous prices. Commercial art

should not be despised. Many people have the good sense to frame and hang some of these Posters on their walls and some that I have seen a real joy to the home.

It is often a test if a picture is good or bad if we can grow old with it and it still remains a pleasure.

Humour is one of the greatest assets in Poster work. Everybody enjoys a good laugh and the more sincere the laugh the better humour we find ourselves in. Many poster agencies discover this.

If they can make us laugh with them they have created a bond of sympathy and half the battle is won as we remember the laugh and the pleasure we enjoyed.

HOW TO USE A POSTER

1. In the City.

In the city a Christian poster will be up against heavy secular competition. Therefore a site should be chosen for display where the poster will be shown to its best advantage. It must also have a certain amount of protection lest it be destroyed by the mischievous passerby.

If possible get a street corner site which is not too much encumbered with advertising. If one has his own premises in the bazaar area a good plan is to build the poster board into the wall so that it can be manipulated from the inside. A glass front will keep it clean, and at night lighting can easily be controlled. Various lighting effects can be utilized. Change the colour of the light from time to time. Try tube lights about the width of the poster placed at the top and the bottom, shielded from the eye but directed on the poster.

The usual ample space of the mission and church compounds offers opportunity for good poster display. A wayside pulpit with room for two posters, one in English and one in the local language, with regular changes, will serve a good evangelistic purpose.

2. In the Villages.

The village offers a rare opportunity to use posters. The high rate of illiteracy in the average village will work against a word poster being as effective as it might be, but with some personal attention being given as people gather around, the worker in charge can use the poster as a text. Posters with adequate pictorial presentation will of course be much more effective than type alone.

Evangelists, teachers, compounders and nurses stationed in a village should use their compound and house walls to display Christian posters. A certain worker puts his posters up only in the evening when there is more traffic on his village street and stands by the posters to explain them to people. In this rather drab part of the village a bright coloured poster thus reaches out, through the catechist, with the Christian message.

Village preachers who cover a circuit of villages from day to day

should either paste their posters on large stiff pieces of cardboard so that they can be stood up at street intersections, or paste cloth on the back, and carry them in a tin cylinder, and then display them from a frame of bamboos which can also be folded up and easily carried.

Posters have been used as a follow-up after an evening filmstrip programme. In presenting the filmstrip certain pictures are emphasized as the strip is being projected. For instance, in the Prodigal Son, the important picture would be the return of the son to his father and the affectionate embrace. Herein is shown the love of the father for the returning prodigal, illustrating the great truth of God's love for repentant humanity. The next morning, this frame presented in poster form throughout the village will not only emphasize again the truth presented the night before but will give further point of contact.

3. Other Uses.

At Melas and other large gatherings, posters used as placards and carried high above the crowd on bamboo frames bring the message to many. Several posters carried in this fashion by colporteurs help to sell Christian literature.

The sides of a touring van can be utilized effectively. Permanent or detachable frames holding various posters will attract people at stops along the way. It is easy to talk about what one sees, and impressions will remain after the van has gone on to the next stop.

Church buildings and premises provide excellent places for display. It may not be thought amiss to display a poster in a prominent place in the church so that the worshipper can see it during the service. A message delivered through it challenging to deeper consecration, to giving more generously to home or foreign missionary work, to young people for life dedication—any of these messages will not be inappropriate in the House of God. However, if there is objection, the same posters can be tacked to the bulletin board at the church entrance.

In a school building or other Christian institution heads of stairways are effective places for well-chosen posters.

POSTER AVAILABILITY

A limited number of printed posters are available in the languages of India. Posters on health, literacy, agriculture and education are to be had from both Christian and secular sources in English and the Indian languages. But I have confined myself strictly to posters which deal with the evangelistic challenge through Bible texts, pictures or messages setting forth the claims of Christ.

Although the number of strictly evangelistic posters is at present small, Christian artists are at work producing for the National Christian Council Poster Committee suitable posters to be printed in the various languages. Text posters thus far lead the field and

are being used widely and with good results. A list of publishing agencies is appended at the close of this chapter.

Original posters, however, can be made to meet local needs. The evangelist, pastor or missionary should make his own posters. Even as an enlarged photograph has more attraction and interest than a small snapshot so the Word of God enlarged, set in attractive format, plainly displayed, will deliver a message more readily. If there is some talent and imagination the following modest kit will produce usable posters:

1. Standard size 10″ x 30″ poster paper or thin cardboard. This is available at any press, ranging in price from one to four annas per sheet. Newsprint is much cheaper—about a pice a sheet.
2. A drawing board of light wood or a smooth table top, a scale, and if possible a tee-square and a set of celluloid triangles.
3. A few ball point pens of various sizes and a couple of brushes.
4. Yellow, red and blue store card paints at about Rs. 2-8-0 per bottle. Also a bottle of black Indian ink at Rs. 1-8-0. (Bazaar dyes are cheaper and are usable.)

The above materials can be purchased from Messrs. V. Perumal Chetty and Sons, Stringer's Street, G.T., Madras, or from Messrs. G. C. Laha, Dharamtala Street, Calcutta.

POSTER AGENCIES

Christian Literature Depot, 55 Linton Street, Calcutta, publishes bi-weekly posters entitled, 'Moral Armament Posters'. Subscription per annum Rs. 15. Text only.

Christian Literature Society, Park Town, Madras, handles three new health posters. Price 8 annas each. Pictorial. Also a number on Stewardship, Evangelism, The Christian Family, etc.

Christian Book Depot, Raipur, M.P. Two posters by Miss E. M. Brown in Hindi, "Thy Word is a Lamp", and "Except Ye Become as a Little Child". Pictorial with Bible text.

Evangelical Literature Depot, 11/1 Mission Row, Calcutta. A series of six Bible text posters in Hindi. Price 6 as. each.

North India Christian Tract and Book Society, Clive Road, Allahabad. Six pictorial, Hindi text posters. Price 6 as. each. A series of posters with large hand-coloured pictures illustrating Bible text printed below the picture, in Hindi.

Scripture Gift Mission, 13 Cubbon Road, Bangalore. Bible text posters in various languages.

National Christian Audio-Visual Aid office, P.O. Agricultural Institute, Allahabad, U.P. They stock all of the above except Bible text posters. Both English and Hindi. Also some 21 posters in Hindi produced by the Allahabad Agricultural Institute on farming, health and economic betterment of villages.

Chapter 14

FLASH CARDS

DONALD F. EBRIGHT[1]

WHAT ARE FLASH CARDS

FLASH cards are small cards approximately 10 x 12 inches which are "flashed" (turned over at short intervals) before the class.

Just as we recognize a filmstrip as a continuous length of film with 10 to 40 or 50 pictures arranged in a sequence; so flash cards are 10 to 40 or 50 pictures on cards arranged in a sequence to present an idea, story or lesson. In a filmstrip projector a knob is turned to bring the next picture on the screen. With flash cards the teacher holds the pack of cards and turns down a card to bring the next picture in view. The technique to be used in presentation will depend upon the subject, location and the audience.

The message each card contains should be brief and to the point. During World War II the Army devised a method for the recognition of enemy airplanes. They used flash cards. Each card carried the picture of one airplane. These cards were flashed before the class and the score of the learner was based on the number of airplanes he could identify.

HOW TO USE FLASH CARDS

In general the same methods of utilization that apply to other visual symbols are applicable to flash cards. They are: (1) prepare the class, (2) present the flash card lesson, (3) follow up with questions, test or discussion, and (4) review.

Flash cards can be used effectively in India because they are small and compact, economical and easy to prepare by leader or learners. Their small size enables a pastor or teacher to carry them in a pocket or brief case. Most flash card sets in India sell for approximately Re. 1 (22c) and contains 12 to 20 cards.

The first sets of flash cards widely used in India were the Jet-Men Health Series by Dr. Gladys Rutherford of India Village Service

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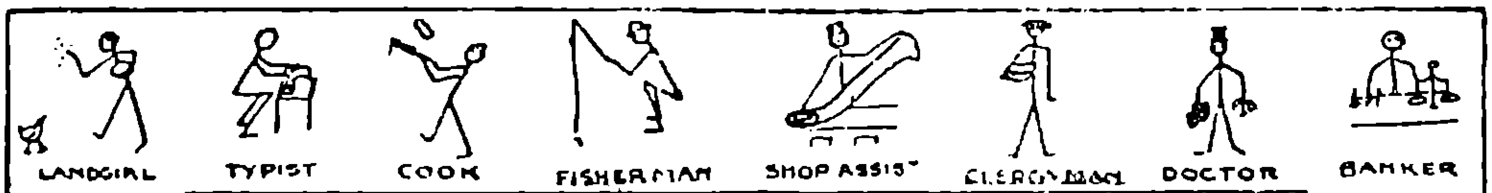
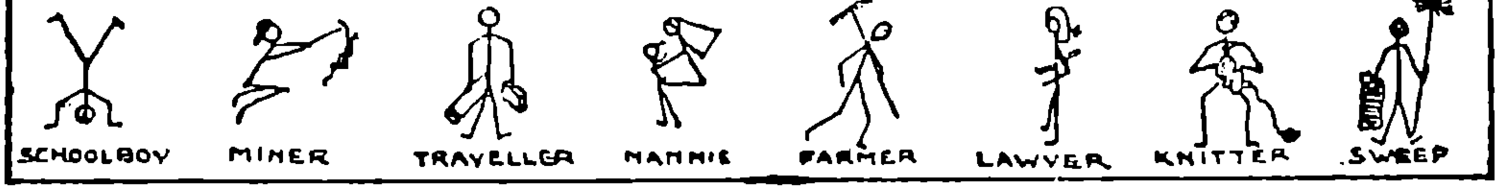


who was long interest in Health Education and the training of village workers in preventive measures. She drew black stick-men (Pin-men in the United Kingdom) and called them JETS. She drew a series to illustrate causes and prevention of common diseases in India. Each card shows one idea with no shading, little scenery and the characters are stick-men. If the characters had regional costumes the use of the flash cards would be limited to that small area. Stick-men are not Punjabi, Gujerati, or Tamil but *men* with sore-eyes, malaria or cholera. The Jet Health Series Flash Cards average 15 cards per subject and come collated in a printed envelope. Subjects include: (1) Malaria, (2) Itch, (3) Tuberculosis, (4) Fly control, (5) Hookworm, (6) Cholera, (7) Safe village well, (8) Round worm, (9) Leprosy, (10) Sore eyes, (11) Compost Making and (12) Tetanus (with reference to new born babies). Over 20,000 of these sets have been printed. They are available from the Tract and Book Society, 18, Clive Road, Allahabad, 1.

These humble and ancient symbols can be used in blackboard work with great effect. A few strokes with chalk or brush can produce a striking poster or chart. Study the figures on this page to see how effective Jet-men are for striking characterizations.



Jet-men are easy to Draw and Fun

Flash cards are also published by the Extension Department of the Allahabad Agricultural Institute. They are the same size as the Jet Health Series but the figures are not the match-stick type. There are three sets with Hindi and English notes: (1) *Chechak* (Smallpox); (2) *Koora Karbat ki Khad* (compost pits); and *Sokhta* (Soakpits).

The latest addition to the flash card family is the Stewardship Set of ten cards produced by the Audio-Visual Aids Committee of the National Christian Council of India and adapted from the Philippine Stewardship set. The price is Re. 1 for the set which is collated and sold in a printed envelope. A Hindi-English booklet with commentary and notes is included.

HOMEMADE FLASH CARDS

In addition to these commercially prepared sets the pastor or teacher should recognize that simple flash cards are easy to prepare. Cardboard 10 x 12 inches is readily available. One missionary on furlough collects used cardboard "shirt boards" used in most commercial laundries to give shape to freshly ironed shirts. She uses these in flash card workshops where the District pastors prepare their own Life of Christ set.

A simple flash card may be prepared by writing, printing or drawing on a plain sheet of white paper and pasting it to cardboard. If the cardboard is white or of a light tone the writing, printing or drawing may be done directly. Plain wrapping paper, light colored construction paper, discarded cardboard or cardboard boxes make good flash card material. Large sheets of cardboard, 28 by 44 inches, available in the bazar, may be cut into eight pieces, 11 by 14 inches each.

Lettering may be applied by (1) written form, (2) free-hand printing, (3) commercial printer, (4) stencil, (5) cut-out letter set, (6) rubber stamp set or (7) last of all the local school drawing master may be induced to letter the flash cards. However, many flash card sets consist of drawings only with no lettering.

The following suggestions will help in the preparation of your own flash cards or the conducting of a flash card workshop:

(*a*) Make a rough sketch on plain paper.
(*b*) Draw guide lines with ruler for such lettering as you need.
(*c*) Mark off area for illustrative material.
(*d*) Draw in pencil and then trace with crayon, paints or ink.
(*e*) Use pen with thick point or speedball pen or brush.
(*f*) Make letters one inch high on a 10 x 12 inch card.
(*g*) Black ink is effective but color adds impact.
(*h*) Finish with line drawing, sketch, cartoon, etc.

Flash card sets may be used in many situations.

TYPES OF FLASH CARDS

(*a*) Grammar. Many common errors in speech may be avoided by use of flash cards with correct use of word prepared.

(*b*) Vocabulary. Few aids are more effective than vocabulary lists on individual cards.

(*c*) Arithmetic. The use of flash cards lends itself to the teaching of basic arithmetic. All age groups learn quicker when flash cards are utilized to teach fractions, decimals, percentage and forms of measurement.

(*d*) Bible Study. Flash cards with book and chapter outlines will aid the leader in a village setting as well as a drill for key memory verses or review of fundamental points.

(*e*) District Program. Set forth the program for your District on flash cards and use in Refresher Courses or Pastor's meetings.

(*f*) That "idea" to get across. Whether it is: stewardship, better homes, an improved stove, compost pits, how to worship, message of St. Paul, outline of Passion Week, Christian symbols, what it means to be a Christian. The simple flash card is an effective aid, both simple to prepare and easy to use.

Flash cards may be used with other aids in making a multi-impact upon the learner. The blackboard, model, demonstration, sand table, flannelgraph, flat picture or filmstrip may be utilized by the teacher to supplement the flat picture in getting the lesson across to the class.

TIPS FOR BETTER USE

Flash cards will be more effective if:

(*a*) The wording is as brief as possible.
(*b*) The lettering is large enough for the class to read.
(*c*) The class is prepared before flashing the cards.
(*d*) The card is flashed in time with the commentary.
(*e*) The cards can be seen by all.
(*f*) They are exposed long enough for comprehension.
(*g*) The first slow-paced flash-through is followed by a quick flash-through review.
(*h*) The flash cards can be displayed after the lesson on a wall or bulletin board.
(*i*) This aid is used with other teaching tools.

Chapter 15

FLAT PICTURES

CONRAD P. HEINS[1]

FLAT pictures are pictures intended to be looked at directly by the pupil or on the screen when projected by an opaque projector. (See Chapter 22.) They are one of the most common and most useful of the audio-visual aids available to the teacher or religious worker in India. But because of this very availability, they may be taken too much for granted and their true worth overlooked in the preoccupation with cinema and filmstrips, flannelgraph and puppets, and the other "more advanced" aids. If properly used, however, a good set of pictures can still be one of the most effective audio-visual aids a school or district worker can have.

Flat pictures may be listed as photographs, illustrations or stereographs. Photographs are a familiar and valuable visual material. They can appear in one color (sepia or black) or in full color. Illustrations are more widely used than photographs. They include every type of non-photographic reconstruction of reality, from the artist's canvas, etchings, lithograph, or color prints to the drawings by illustrators. Stereographs offer a three-dimensional still picture when viewed through a hand held viewer.

VALUES

The chief value of flat pictures, as with projected pictures and other visual aids, is that they give the viewer a concrete visual image of the object under discussion in place of the vague and often erroneous mental image evoked by words alone, The old adage that "a picture is worth a thousand words" has been worked pretty heavily in support of all sorts of visual aids, but it should be remembered that it was an ordinary flat picture that the original author had in mind.

The particular values of flat pictures as compared with other audio-visual aids might be listed as follows:

(1) *Cheapness and availability*—Every illustrated magazine is a potential source of valuable pictures for teaching purposes, and a

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number of publishing houses provide pictures on almost any subject at very reasonable rates.

(2) *Ease of use*—No darkened room or extra equipment is required. The pictures can be held up by the leader, passed among the group, or mounted on the wall or on cords. While the teacher should select his pictures carefully and give thought to their most effective use, no advance bookings or elaborate preparations need be made.

(3) *Naturalness in the teaching process*—Flat pictures, introduced at the appropriate place in a lesson or discussion, fit right in and illustrate the point. The normal process of learning is lighted up and made more interesting without the creation of a "picture show" or entertainment atmosphere which so often attends the use of projected aids.

(4) *Wide scope*—The teacher or religious leader who seriously sets out to build up a picture library can find pictures on almost every subject. Such a library can be constantly expanded and improved. Schools, especially, will find a good picture library a great help if it is properly indexed and maintained and the pictures properly mounted.

(5) *Flexibility*—Pictures can be selected to fit the immediate need and viewing audience. Many or few may be used as seems best, and the order of showing may be adapted to the presentation of the lesson.

HOW TO SELECT

A poor picture is perhaps better than no picture at all, but good pictures are needed for effective teaching. When choosing pictures for the library or selecting them for use, the principal things to look for are as follows:

(1) *Clarity*—Is it a good reproduction? A good teaching picture must be clear and definite. Is it simple and uncluttered? Children and uneducated people often get lost in the details of a complicated picture and fail to see the main subject. Sometimes, of course, the subject itself is complex, as in the case of a city or a bazaar, but even then the important elements should stand out.

(2) *Human interest*—Does the picture hold the attention and tell a story? Action pictures are usually more effective than stilted or lifeless shots. In illustrating the nature of snow for instance, which would be more effective—a beautiful photograph of the eternal snows on the Himalayas or a snapshot of children making a snowman?

(3) *Composition*—Is it a good picture in itself with a main centre of interest and pleasing composition? Even untrained people respond better to a picture that has unity and good composition.

(4) *Suitability*—Does it illustrate the subject and does it fit in with the environment and experience of the viewers? Any pictures

intended to lead to a desirable course of action, such better health practices or village uplift, etc., must be realistic and fit the Indian setting. Even those illustrating things which are essentially foreign should, so far as possible, tie in with the experience and interest of the viewers. A picture should represent the situation as one might see it if one could visit the place in person.

(5) *Imagination*—Does the picture stir the imagination and lead to questions and discussion.

(6) *Colour*—While not essential, colour does add to the usefulness of many pictures. A good colour print makes things stand out and adds to the realism. However, a poor print where colours do not properly register or are not true to life, should not be used.

HOW TO MOUNT

To be of continuing value, pictures must be properly mounted. The simplest and most effective method is to paste them on good quality light-weight cardboard. For this purpose a good mounting paste, such as that made for photographic albums, should be used. Ordinary gum or wet paste makes the pictures buckle and look unsightly. Best of all, if available, is the rubber cement made especially for such mounting purposes. The mounts should be fairly uniform and of standard sizes for ease in filing and handling. A comfortable margin should be left around the picture. Each one should be titled and indexed with the general and specific subject. If possible an explanatory note should be written or pasted on the back. If the pictures, especially the more valuable ones, are coated with a clear waterproof varnish, they will be better preserved. Care should be taken, however, to use a varnish that will not get sticky in wet weather.

HOW TO FILE

The ultimate usefulness of a picture library will depend in large measure upon the effectiveness of the filing and indexing system. Big jumbles of loosely related pictures filed under a few general headings, will, for the most part, remain in the file. But if a teacher or other worker can see at a glance the types of pictures available and readily locate those that meet his need, it is easy to encourage a wide use of the picture library.

A good picture library consits of two parts—the picture file and the index.

The File—The file should be divided into main headings corresponding fairly closely to the subjects in the course of study, with an ample number of sub-headings under each subject. For example, under Geography, the subheadings could consist of the continents and countries to be studied with extra headings to cover outstanding geographic features such as rivers, mountains, etc. Each

situation will differ somewhat and the file headings should be chosen to meet the individual need. Time should be taken, however, to work out an adequate list of headings at the beginning or confusion will result later on.

Filing Equipment—If possible, one or more drawers in a steel letter filing cabinet should be used to house the picture library. Each main section should be divided off with cardboard markers and sturdy cardboard folders should be used for each sub-heading, with the subject clearly marked on the folder tab. But in lieu of expensive equipment a wood box or discarded tin trunk may be used.

Numbering System—Each picture should bear the number. When the pictures are sorted under the various headings they may be numbered right through the file and then the next number given to each new picture as it is added to the file. For the more ambitious, a better, though more complicated system is to assign a key number to each main heading, number the pictures that fall under that heading accordingly, somewhat like the Dewey Decimal system, for regular libraries—i.e., Geography might be 100 to 200 with Africa 110, Asia 120, etc. In any case, a register should be maintained illustrating each picture and giving its number, its title and location in the file.

The Index—A cross-index is important as a means of locating pictures relating to a subject but filed under another heading. A picture of a kangaroo for instance might be filed under Australia, but if it were listed in the index under "Animals" also it would be easy to locate. The best type of index is listed on 4 x 6 inch cards each with its appropriate heading and listing the number, title and location of the pictures that would fall under that heading.

SETTING UP THE FILE AND INDEX

Needless to say, the setting up of a picture library involves a good deal of work. A good way to get started is to make it a staff project. The interest and enthusiasm of the staff should be awakened and then, on a Saturday or holiday, a workshop held for the selection, mounting, numbering and indexing of all the pictures that have been accumulated. This type of project is valuable not only for getting the work done, but as a means of acquainting the whole staff with the pictures available and giving them the sense that the new library is their own.

After the file is established it should be put in charge of a teacher who is enthusiastic about it. He should be given adequate time for finding, mounting and indexing new pictures for the library, and seeing that the pictures are maintained in good condition and in the proper order.

SOURCES OF PICTURES

The sources of pictures for a library are many and varied. The following are some of the most rewarding:

(1) *Picture Magazines*—Illustrated Weekly, National Geographic, Life Magazine, and other similar publications. The National Geographic Society makes available copies of pictures published in its magazine for school purposes.

(2) *Story Magazines*—The advertisement section of story magazines is a rich source of many types of pictures.

(3) *Supply Houses in India*—The Christian Literature Society, Post Box, 501, Madras and the Lucknow Publishing House, 37 Cantonment Road, Lucknow, have many pictures, especially of a religious nature, for sale. The Perry pictures in the U.S.A. specialize in providing all sorts of pictures for educational purposes.

(4) *N.C.C. Film Libraries*—These two A-VA centers often have religious and other pictures available for loan or sale. Write to Rev. H. H. Ferger, P. O. Agricultural Institute, District Allahabad, U.P.; and Rev. R. G. Korteling, Punganur, District Chittoor, for catalogues.

(5) *Discarded text books*—and other illustrated publications.

(6) *Sunday Schools and Churches Abroad*—It is often possible to get used sets of Sunday School pictures from friends in U.S.A., the United Kingdom or the Continent.

(7) *The India Sunday School Union*, Coonoor, Nilgiris, South India, has sets of religious pictures suitable for Sunday School and similar use.

HOW TO USE

Pictures may be used in manifold ways. The following are a few suggestions:

(1) *To introduce a subject*—A good picture will awaken interest and raise questions, the discussion of which will often bring out many aspects of the subject under consideration. At the beginning of a unit on the *World in Which Jesus Lived*, for example, ten well-chosen pictures can arouse curiosity and prepare the class for this new subject matter.

(2) *To illustrate particular points*—As mentioned above, pictures can be introduced easily and naturally at the place called for by the development of a subject to light up and make clear the particular points under consideration. What is a gear, palimpsest, bivouac, scroll or tabernacle? A picture can clarify this particular point. Students should be encouraged to use pictures to illustrate their own oral reports or written compositions.

(3) *To answer questions arising during discussion*—There is nothing like a picture to answer the question as to the structure of a Duckbill-Platypus, or a three-toed Sloth!

(4) *For story telling*—Sets of large pictures illustrating Bible stories or folk tales can be mounted on a stand or easel and turned over one after the other as the story progresses giving much the same effect as a filmstrip or series of slides.

(5) *For decorating classrooms, hostels, etc.*—Good pictures help to set the tone of a room and have an influence on the thinking of the viewers. This is especially true if the pictures are changed occasionally. Frames of standard sizes may be used having removable backs so that the pictures can be changed at regular intervals.

(6) *Little-Theatre picture roll*—Where a series of pictures are available illustrating a story, they may be mounted on a roll of paper and set up so as to be run through a little stage made to resemble a cinema theatre. This method is very effective with small children and rural people.

(7) *Picture albums*—Series of pictures mounted in special albums can be effectively used with small groups. The pictures of Elsie Anna Wood on the Life of Christ, or the photographs from the new film—"The Transformed Life"—make very good units for this purpose.

(8) *Picture sermons*—A sufficient number of small-sized copies of a picture may be obtained so that each member of the congregation may be given one. A sermon built around the picture becomes much more effective as the listeners are able to view the picture under consideration. Many helpful suggestions along this line are to be found in "Christ And The Fine Arts", by Cynthia Pearl Maus.

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Wittich, Walter A., and Charles F. Schuller, *Audio-Visual Materials:* Their Nature and Use, Harper, 1953.

Sources of Flat Pictures in the U.S.A.

British Information Services, 30 Rockefeller Plaza, New York
Creative Educational Society, Mankato, Minn.
Friendship Press, 257 Fourth Ave., New York 10.
Informative Classroom Pictures Association, 31 Ottawa Ave., N.W., Grand Rapids 2, Mich.
Latin American Studio, The, 3530 State St., Santa Barbara, Calif.
National Geographic Society, 16th and M. Sts., N. W., Washington, D.C.
Realistic Visual Aids, Highland, Calif.
World Book Encyclopedia Reference Library, Field Enterprises, Inc., Educational Division, Merchandise, Mart Plaza. Chicago 54.

Sources of Flat Pictures in Great Britain.

Selected List of Illustrations, with an introduction on the Selection and use of Religious Pictures, 24 pp., Institute of Christian Education, 46, Gordon Square, London, W.C.1., price 1.
Bodleias Library, Oxford.
British Museum, London, W.C.1.
A. & C. Black, Ltd., 4, Soho Square, London, W.1.
Edinburgh House Press, 2, Eaton Gate, London, W.W.1.
H.M. Stationery Office, Kingsway, London, W.C.2.
Lutterworth Press, 4, Bouverie Street, London, E.C.4.
Imperial Institute, Exhibition Road, South Kensington, London, S.W.7.
National Sunday School Union, 104, Newgate Street, London, E.C.1.
The National Society, 69, Gt. Peter Street, London, S.W.1.
Society for Promoting Christian Knowledge, S.P.C.K. House, Northumberland Avenue, London, W.C.2.
Main Missionary Societies and specialized bodies.

Chapter 16

OBJECTS, SPECIMENS, MODELS, MAPS AND GLOBES

RALPH G. KORTELING[1]

WHAT we know of the world outside ourselves comes to us through the five senses,—touch, sight, hearing, smell and taste. While about 85% of knowledge comes to us through the eye and ear gates, a wise teacher will use all the senses in the process of learning. This is the way a father 3,000 years ago taught his son to fish, and it is still the best way. We learn by doing. Learning to cook was a first-hand direct experience at the dawn of history. Isn't it still the best way to learn cooking?

Objects, specimens and models have the advantage of comprehension by all five senses. Pupils can see, smell, touch and taste an avocado pear. When they have gone through that experience they will have an intelligent and unforgettable understanding of that species of fruit. The best way to teach the difference between a genuine rupee and a counterfeit is to see, handle, and hear the sound of both when tested. By means of a model, the human eye can be more easily and quickly understood than by looking at the eye itself. Let us distinguish between these three,—objects, specimens and models.

Objects: This group includes anything from jet planes to grasshoppers. An object is the thing itself.

Specimens: These are small parts, segments, or samples of the real thing, such as wood, cloth, signatures.

Models: Models are replicas of objects or significant units, usually on a smaller or larger scale.

A wise teacher will have his class supply objects and specimens available in the area or community. The school or Church museum can become a valuable collection of all sorts of interesting things. Such a collection to be useful and appealing calls for careful classification and arrangement.

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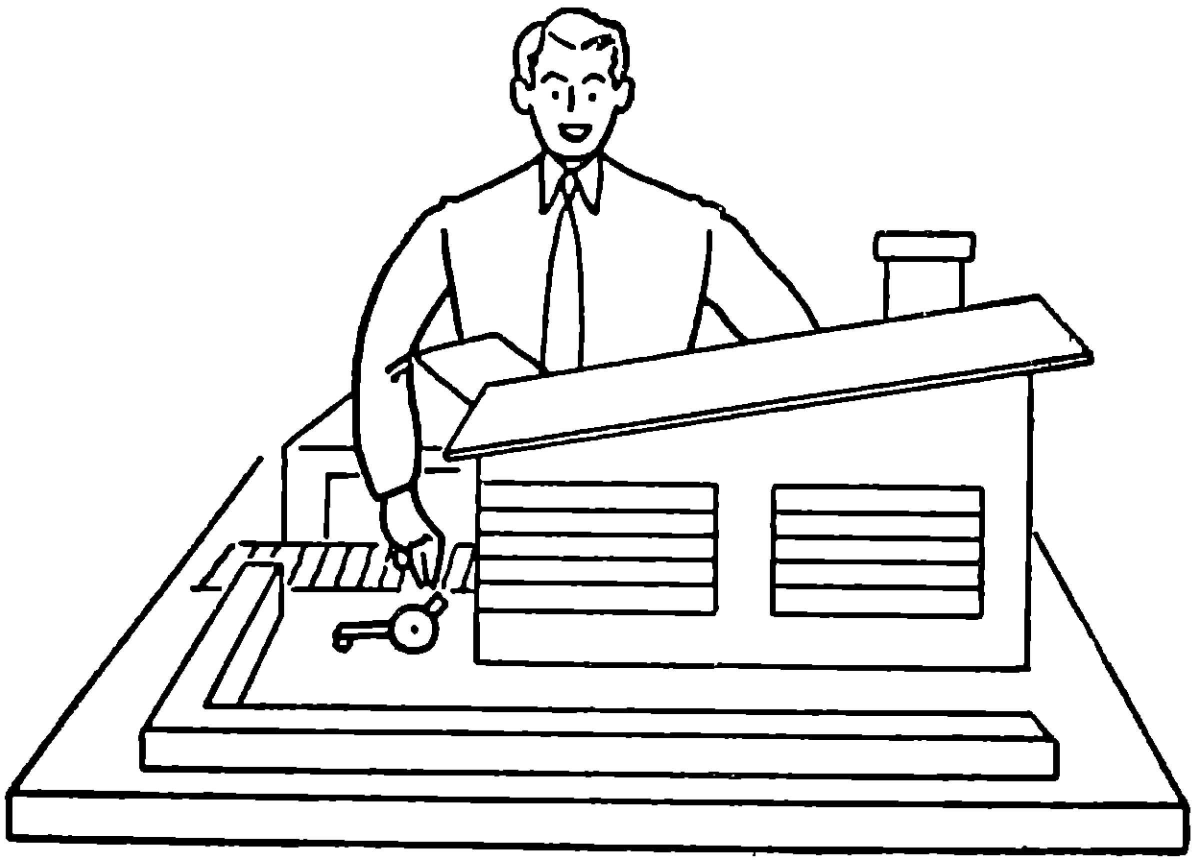
The principles underlying effective use of objects, specimens and objects are fourfold.

1. The pupil must handle the objects and work the models. The study should include supplementary reading, writing, drawing, photography, demonstration, etc.



2. Observation and handling must be directed by the teacher. The pupil may be interested in one aspect and miss others. He must see and learn what the teacher wants him to see and learn.

3. Relationships must be learned. A piece of rosewood must be related to the rosewood tree, and that tree to its geography and economics. Large gaps of information between specimens and reality must be bridged by further study.

4. These visual and sensory aids must be thoughtfully integrated with the unit of study. Time can be wasted as well as gained by the use of these materials. There is an old adage, "Not only is he idle who does nothing, but also he who might be better employed"

Objects illustrating spiritual truth

Often an object will get attention, arouse interest, clinch a truth better than mere words. No teaching in the Bible has impressed itself more deeply on the mind than that contained in the parables. Many of these are short stories built around the concrete experience of the people. As he looked over the fields of Palestine and saw a sower—Jesus directed the attention of his hearers to the four conditions of soil upon which the seeds fell. On another occasion it was a vineyard he used to convey his message. Picking a Lily he held it so all could see and spoke of the care of the Heavenly Father. "You are the salt of the earth",—weighted with unending blessing, these words have travelled down the centuries.

Anyone who would teach children and adults, both in town and village, could do no better than study the method of Jesus and the Bible to teach spiritual truth. We must always remember that we learn through symbols. Colours are symbolic, words spoken and written are symbols, geometric figures are used as symbols, pictures are full of symbolic meaning, animals symbolize certain characters, architecture is symbolic, music is symbolic, the interpretive dance is used in the same way,—in fact all of life and education deals with symbols, and he who would influence his fellowmen must use symbols. They are visible signs that convey ideas and qualities.

Jesus has given Christianity its most important and universally accepted symbol—the cross.

The Master Teacher is constantly using simile and analogy. The former is a figure of speech by which a thing or action or relation is compared to something different in kind or quality. "You are the light of the world", "I am the vine, you are the branches", "Sheep without a shepherd", "Chief corner stone"—all these visible objects carry a spiritual significance. An Analogy places emphasis on relationships. It is a form of inference that if two or more things agree with one another in two or more aspects, they will probably agree in yet other respects. The Hebrew language is especially rich in figurative speech, and we must take advantage of this fact in our teaching and preaching. Let us consider a few examples:—

1. The audience is a village congregation, object—to teach the necessity of indestructible foundations for religious faith, scripture—Matthew 7: 24-27. There are various audio-visual aids we might use to carry home the lesson with conviction. We might use the C.L.S. poster of eight separate pictures telling the story. Or better still we could cut these eight pictures out of the poster and use them one at a time on a flannelgraph board with more suspense and dramatic effect. Still another method might be to show projected slides of deep excavation for tall buildings. This not being available, the teacher could very usefully employ blackboard and chalk to draw and indicate the importance of foundations to building. Objects could be made to serve in an excellent way the aim of this lesson, at no expense and with little physical effort. Get a good solid stone and a platter of sand. Demonstrate what happens when the wind blows and the rains descend first upon the sand and then upon the rock. The one is unstable, the other immovable. Only when we build our lives on the rock of God's revealed truth, can we be prepared for any and all of the trials and temptations that may come our way. Many Bible verses in the Old Testament can be enlarged upon to indicate God as our Rock and our salvation. Using these simple objects of rock and sand, wind and water, the teacher or evangelist need not fear his audience will go to sleep. They will be interested, learn the lesson well and remember it for a long, long time.

2. Audience may be any type,—purpose to show the effect of God's self giving love revealed in the cross of Christ,—text Rev. 1: 5 "Unto Him that loved us and washed us from our sins in his own blood". Here are very evident divisions of thought, 1—sin soils our souls, 2—the sacrifice of Christ cleanses, 3—result is purity of life and thought. Earlier in this chapter we said that colors are used as symbols. Three pieces of colored construction paper can be easily obtained and used over and over again. A black or dark grey sheet represents the sinful condition of the mind of man, a white sheet represents cleanness and purity, a red paper is symbolic of the blood of Christ. The divine gift of our Lord and his death for us alone can change the heart of man and make it right with God and our fellowmen. Numerous Bible verses can be used to drive home the teaching.

3. A series of illustrated talks could easily be made on the Kingdom of God as related in the gospel according to Matthew, chapter 13. Objects: seeds, tares, cup of curds, bag of treasure, pearls, fishing net. One may say, as a bachelor of divinity did to me, "My people know what seeds are, you do not have to show them". This minister did not realize the value of objects to attract attention and hold interest in the learning process. The point of using these symbols is to progress from something the people know to something they do not know.

4. A shower of blessings. This is another type of object lesson teaching. A resourceful teacher conceived the idea of tying notes by colored ribbons to the ribs of an umbrella. These were carefully concealed inside the closed umbrella. After a proper introduction the umbrella was opened and a shower of notes fell from the end of the steel ribs surrounding the person. Then come the exciting experience of reading the notes that described a few of God's many blessings. Naturally the Bible text for such a lively demonstration would be Ezekiel 34: 26, "There shall be showers of blessing".

5. The important thing to learn in using these means to teach Bible lessons is the visual point of view. It employs the eyes as well as the ears in creating ideas in the mind. When the teacher and preacher keenly desire to instruct with all the means at their command they will find the world full of object lesson. Just by way of suggestions the following list is appended:—

(*a*) Hammer, Jer. 23: 29, "Is not my word like a hammer that shatters stone"?

(*b*) Sword, Eph. 6: 17, "Take the sword of the spirit, that is the word of God".

(*c*) Cup of water, Matt. 10: 42, "Whosoever will give one of these little ones a cup of cold water because he is a disciple, I tell you he shall not lose his reward".

(*d*) Ring, Luke 15: 22, "give him a ring for his hand".—symbol of love.

(*e*) Poor mirror, I Cor. 13: 12, "at present we only see the baffled reflections in a mirror, but then it will be face to face".

(*f*) Basket of fruit, Amos 8: 1, "and behold a basket of summer fruit".

(*g*) Plate of salt, Matt. 5: 13, "you are the salt of the earth".

(*h*) Light, Ps. 119: 105, "Thy word is a lamp unto my feet, and a light unto my path".

(*i*) Crown, Matt. 27: 29, "crown of thorns", II Tim. 4: 8, "crown of righteousness", Jos. 1: 12, "crown of life", I Peter 5: 4, "crown of glory".

(*j*) Calendar, Ps. 90: 12, "teach us to number our days".

(*k*) Certificate, II Cor. 3: 2, "you are my certificate . read by all men".

(*l*) Bag with holes. Hag. 1: 6, "He who earns a wage puts it in a bag with holes".

(*m*) Dry bones, Ezk. 37: 3, "son of man, can these bones live?"

(*n*) Candle, Prov. 20: 27, "The spirit of man is the candle of the Lord".

Models also can be exciting. A resouceful teacher in India decided to stir the imagination of her Sunday school class. They studied, planned, and made a huge model of Palestine. The whole was 50 feet long and proportionately wide. A spot on the compound was chosen where the sea of Galilee and the Dead Sea might conform to the contour of the Holy Land. Earth excavated from the Jordon River was used for the heights of Jerusalem. When it was completed journeys could be made from Nazareth to Bethlehem, one could walk the Jericho road. What a marvellous activity for interesting and instructing pupils! And what fun!

The same could be done with the city of Jerusalem, showing the temple enclosures. Or a model of Solomon's temple might be constructed following specifications found in I Kings, chapters 6 and 7 and II Chronicles, chapters 3 and 4. If this were attempted it might be well to study the filmstrip and the script, "The Temple of Solomon", obtainable in the N.C.C. Film Library, Arogyavaram, Chittoor District, South India.

Models of Palestinian houses, of altars, of the ark, of bedouin tents, of houses in various countries where the Christian church works,—these all can form activity for expressional work in the teaching process. Models may be made of ancient clay tablets, scrolls on which scripture was written.

Obviously maps and globes apply to children and adults who have had some formal education. They are not simple symbols, easily comprehended. But even these can be made simple. If the idea is to give a conception of distances in the Bible lands, Jerusalem

can be represented by a dot and Bethany 6 miles to the south-east, Jericho 13 miles to the north-east, Nazareth 64 miles to the north, Caesarea Philippi 107 miles to the north. Then these distances must be correlated with distances the village or townfolk know. It may impress one with the limited territory in which our Lord spent his earthly life. Such simple hand-made maps either on black-board or poster paper should stimulate people to learn more of geographical influences, types of occupation, relationship, vegetation, animal life, migrations, etc. Nowadays people are becoming world conscious and maps have jumped into prominence. There is more travel to the far corners of the world today than ever before. Political leaders are constantly on the go not only in one's own land but throughout the world.

Soldiers and students are globe trotters. Commercial and industrial agents cover the earth. The daily press and radio bring news from every land. In such a culture maps become necessities for adequate understanding of places and situations. Papers and magazines print them as visual aids to comprehension. They are of all kinds,—physical, commercial, economic, political, religious, air routes, motor and rail maps, celestial maps, etc.

As a means of locating places and distances on the face of the earth a globe is superior to flat maps. They are more exact because the surface of the world is curved. Times and seasons can be taught with a globe more easily than on a projected map of a country. Latitude and longitude are better represented on a globe. Pupils in Indian schools learn to make globes on the outside of inverted round clay pots.

These visual aids, like all other aids, must be taught. Maps and globes have a language of their own. Because of their more complicated symbolism they are more useful for people who have been trained in interpreting them. They are not merely for reference. They are basic to clear understanding of certain subjects, and should be used over and over again. A map of one's church at work in India can help build up interest and responsibility for the overall enterprise. Again these aids need to be correlated with other teaching materials. Maps and globes while necessary to clear concepts are low in reality. Excursions, pictures, graphs, flannel-graphs, filmstrips, cinema, gramophone-records,—all complement the use of maps. Never depend on one type of teaching aid. All are necessary to a significant understand of man and his environment, and his relationship with God.

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Chapter 17

THE BULLETIN BOARD

DONALD F. EBRIGHT[1]

FOR many years the bulletin board was a place to post "bulletins" or "notices" and was regarded as an audio-visual step-child. Today the bulletin board is one of the most colorful, active and exciting displays in many classrooms. It often covers half of the available wall area. The bulletin board has a two-fold function, (1) to enable the teacher to introduce new ideas or facts, and (2) to enable the class to work as a group and share their learning experiences. It offers the church a challenging medium for reaching people.

In the British film, "Near Home", the boys and girls have made a community study and arranged an exhibit. As one sees the pupils describing the displays one senses the joy they feel in sharing their findings with others. Likewise children enjoy sharing their discoveries with other children. The bulletin board offers an excellent medium to share fresh discoveries. Hence there is a motive for communicating. Ram Das and Asha are bringing the class news. The pastor has a surge of joy to communicate the good-news. He can tell of his church-in-action through bulletin board displays.

An effective bulletin board display followed a field trip to Delhi. The students made a list of the foreign goods they saw in the market. Returning to Lucknow there was much group planning. A map of the world formed the Central feature and the sources of foreign goods in Delhi stores were coupled to it by means of bright ribbons. Another teacher made a variation by use of the world map and the chosen places on it were coupled to pictures from the *Illustrated Weekly* depicting world happenings. Another striking bulletin board display was a map of India with colored tapes linking linguistic areas with copies of Bibles printed in that language.

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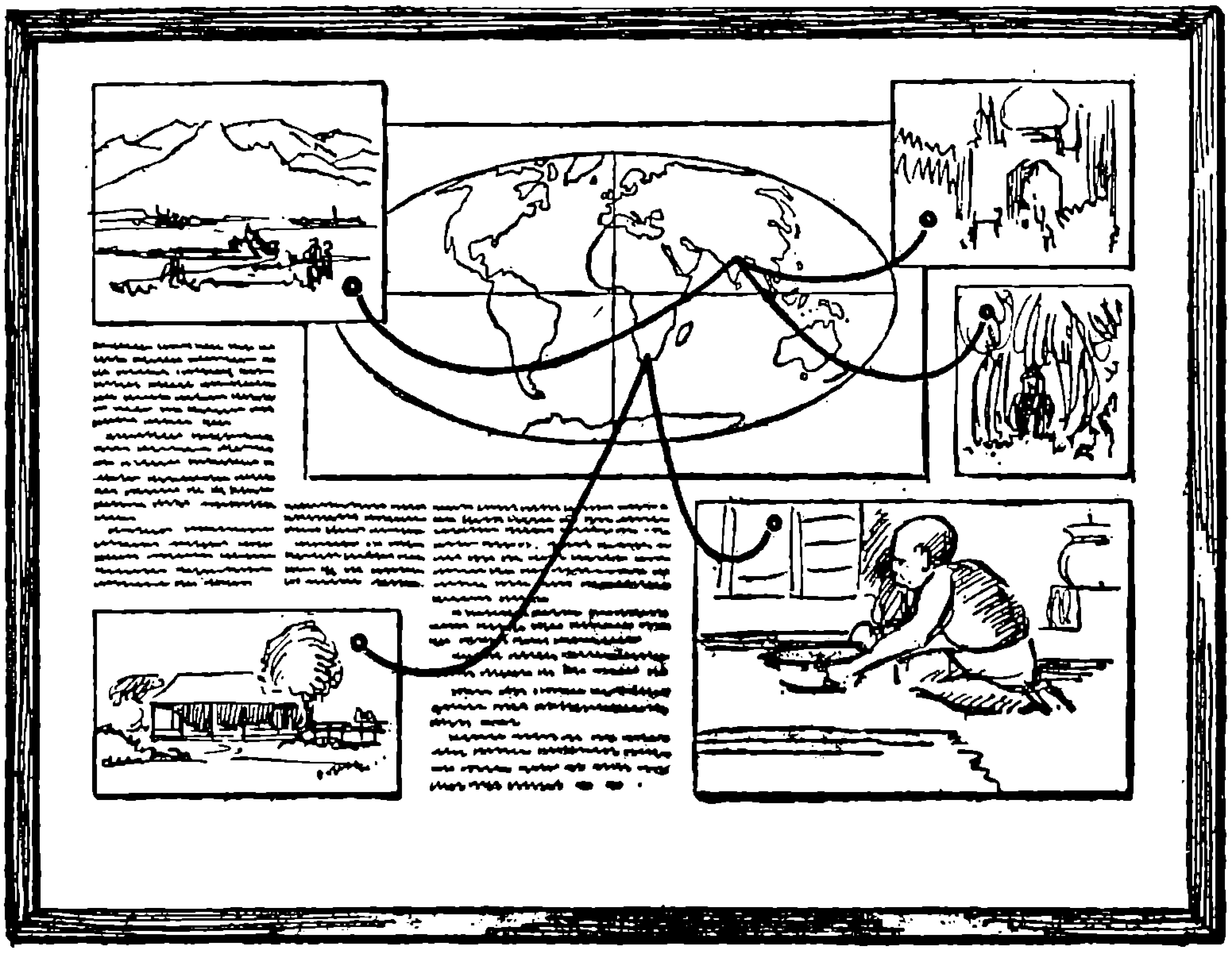
BULLETIN BOARD ITEMS



A typical bulletin board.

Bulletin boards may be used to display many items, such as:

Personal News	Drawings
Announcements	Graphs
Booklets	Pictures
Bulletins	Photographs
Cartoons	Post Cards
Charts	Models
Maps	Specimens
Newspaper Clippings	Subject Outlines

If a conglomeration of these items are put on a bulletin board the result is terrible. The rules of *composition* in photography, *form* in poster making and *display* as in exhibit arrangement all apply to the well-planned bulletin Board.

Those responsible should

(1) Collect, classify and file bulletin board material.
(2) Select material pertaining to the subject.
(3) Arrange all material according to good form and composition.
(4) Prepare neat titles and brief descriptions.
(5) Use colour harmony and balance.
(6) Refer to bulletin board display during class time.

When a teacher or group start to prepare a bulletin board the following steps are suggestive:

(1) Remove all old display and refile.
(2) Dust and clean bulletin board.
(3) Set up display.
(4) Prepare titles where necessary.
(5) Relate all contents to the specific subject.
(6) Caption illustrations if needed.
(7) Check mechanical devices such as coupling tapes, plastic threads, indicating arrows, three-dimensional effects, etc.

HOW TO MAKE A BULLETIN BOARD

The best material for construction of such a board is cork, plywood, composition board or any one of the soft building boards. If soft material is not available, plywood may be covered with burlap (Jute) and will be quite serviceable. A frame will help the effect of the board. It should be securely fastened to the wall or partition because it will have much use.

The bulletin board can be of any length although the vertical dimension should be 30 to 40 inches. Place it at the eye level of those who will be seeing it. A bulletin board for the nursery, adult Bible class, high school and general corridor display will require different heights for maximum visibility. Check the lighting to see that it will be seen clearly.

In many places bulletin boards have been placed at both ends of long blackboards. This relationship between the bulletin board and blackboard makes it easy to correlate the work on each.

A portable bulletin board possesses an adaptability that is desirable in many situations. The district worker in India would profit from a combination board displayed at the Green Lake Workshop in 1952. Two pieces of plywood lifted in and out of a slotted frame. The four surfaces of the two plywood pieces were treated as follows: (1) One was pointed black for a *blackboard,* (2) One was fitted with burlap for a *bulletin board,* (3) One was fitted with flannel for a flannelgraph board and (4) One was painted for a *cinema screen.* This four-purpose board should be very valuable for district evangelistic work. The size will be determined by one's jeep or station wagon capacity.

A COMMUNICATION SERVICE

We are not interested in a bulletin board for casual announcements. To what extent can it carry out the main steps of communication, (1) attract and hold attention, (2) put across the message, (3) develop belief or commitment and (4) produce action?

The bulletin board can attract attention if colour, lay out and

good taste are used. Use colour freely to attract the eye to unconventional shapes and cut-outs. For example, use a circular picture with an $\frac{1}{4}''$ coloured outline, using for the latter construction paper or poster colour. Coloured background, prominent "labelling" and lines to guide the eye will all serve their purpose. Items should not be left too long. Change and hard work are necessary to lift the bulletin board from a dusty thing with cloth on it to a communication device.

In order to get across the message a limited amount of material should be used at one time. Remember the striking displays in the stores on main street.

In much of our bulletin board work we are seeking belief and commitment to the cause we sponsor. Often bulletin boards have leaflets attached to them so that persons who want further information can make an inquiry. A striking bulletin board in a Christian College stressed one point—learn more of the Bible through Correspondence Courses. Application forms for the Bible Correspondence Course, The Light of Life, with headquarters in Chalisgaon, East Khandesh, were attached to the board.

The man who pulls the free leaflet from the bulletin board and writes to Chalisgaon has been led to action as has the woman who goes to the Y.W.C.A. for the Hospital visitation work the bulletin board highlighted. Bulletin boards can become "action boards"

In our church and mission work the desired effect may be an emotional outcome. It assumes that the viewer will identify himself with the material display. The bulletin board makes use of Samuel Johnson's remark that: "Men do not need to be educated as much as they need to be reminded".

Chapter 18

THE BLACKBOARD

DONALD F. EBRIGHT[1]

THE blackboard, or chalkboard, is one of the most universally used visual aids. Properly placed and used it can be of great value in all levels of teaching. In some schools neglect has reduced it to a "grey-board". This means that greater care must be taken to keep it in order as an effective aid. Also, too much wall space is often covered with blackboards that are never used. These unused blackboards take up space and absorb much light. Under modern concepts of classroom design the blackboard is at the front of the room with the remaining wall space converted into display space for pictures, flannelgraph and bulletin boards.

It has been suggested that a blackboard is really not a visual aid but a vehicle for a variety of visual materials. The pastor or teacher with chalk in hand "makes" the meaning on it. This is one of the strong points for the blackboard because it provides an opportunity for creativity and initiative. The main uses of the blackboard are: (1) group planning, (2) daily work plan, (3) drawing space to illustrate discussions, (4) tests and (5) a means of presenting an idea to a group large or small at one time.

Think back on your school days and recall your teachers and the visual symbols they used: (1) the football coach and line formations, (2) the physics teacher and the beam of light passing through a prism, (3) the general science teacher and the cross-sectioned sketch of a muskrat house and (4) the religious education teacher and the Palestinian Time-Line.

Today the blackboard is just as available as a medium for visual symbols and demonstrations. In introducing a film the teacher may go to the blackboard and write the questions which the class hopes the film will answer. In an adult Bible class the teacher can list class needs and indicate the range of problems which the group wants to discuss. A Student Christian Movement team proposes a Gospel

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Team Trek to Badrinath, the Himalayan shrine, so the route from the railhead, Kotdwara, via lorry to Rudraprayog, and then up the Alakananda River to Badrinath is sketched on the blackboard. A village pastor rolls a portable oilcloth blackboard under his arm and at his destination writes the outline of the Book of Mark. An adult literary worker directs his class to write and erase and rewrite the letters they are learning. India's population is soaring so jet-figures are used in a Bible class to illustrate decade by decade statistics.

The following list of items which may be used on a blackboard indicate its versatility:

Drawings	Outlines
Sketches	Reviews
Maps	Daily Problems
Graphs	Announcements
Diagrams	Rules
Technical Words	Tests
Definitions	Musical Notation
Key Words	Illustrating Procedures

HOW TO USE

Let us note several simple suggestions for better use of blackboards.

(1) *Keep the blackboard clean.* This may seem self-evident but it is a rule disregarded every day. This means regular sponging. This also implies the board is clean before the lesson begins. Clean water, Sunlight soap and a wash cloth will brighten the blackboard.

(2) *Keep blackboard work simple and brief.* Copying lengthy outlines is a waste of time for both teacher and pupil. This is also encroaching on the mimeograph department. Blackboards are like store windows on main street. An overcrowded and untidy window display has little sales-appeal as compared with the neat and clean display with a few well-chosen items.

(3) *Make letters and drawings large enough to be seen.* Practise writing a line and going to the back row and looking to see how "your" work appears from the last pupil's chair.

(4) *Plan blackboard in advance.* Do not waste class time for a drawing you could put on before the class starts.

(5) *Collect materials before the class meets.* Gather chalk (white and coloured), ruler, eraser and any other items and like the Boy Scout, "Be Prepared".

(6) *Check lighting.* Avoid blackboard glare. Sometimes it will be necessary to blot out light beams with cloth screens, etc.

(7) *Erase unrelated material.* Any other work on the blackboard distracts attention. Use the eraser—not your fingers.

(8) *Ultra-dramatic effects.* Occasionally the entire blackboard can be covered with strips of paper in advance which will be removed, one by one, as the lesson proceeds.

(9) *Use for demonstrations.* If you cannot secure a working model of a "geyser" a science-class demonstration of "how a geyser works" can be done with coloured chalks on a blackboard.

In presenting your lesson the accent should be on the positive. For emphasis:

1. Underline statements to focus attention.
2. Use chrome yellow or pale green for key-words.
3. Stand to one side and do not block view.
4. Use a pointer.

THE CHALK TALK

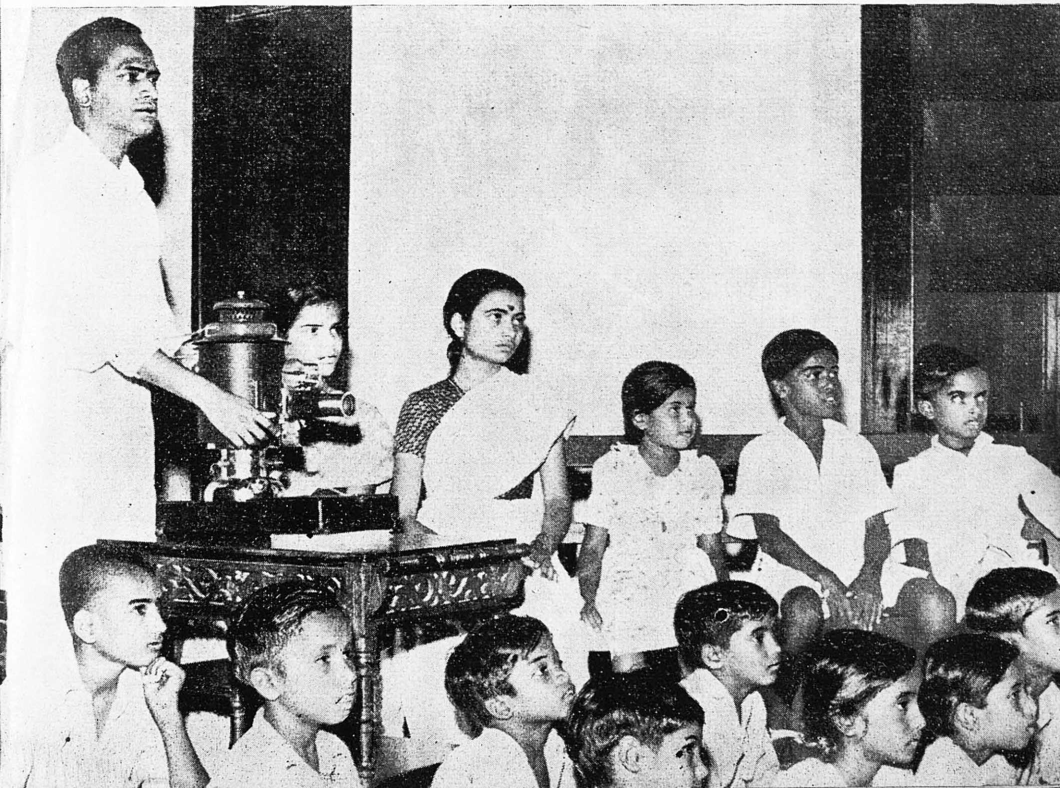
Try a chalk talk—you don't have to be an artist. Of course we have seen highly specialized chalk talks by experts but this should not deter our sincere efforts. Use stick figures, jet-men or pin-men to illustrate your subject matter. A circle for the head, long line for the body and short ones for arms and legs. Minimum background, stick men plus symbolic figures will be effective aids for the Sunday School teacher, pastor or child evangelist. Books are available on chalk talk technique which we recommend for further study.

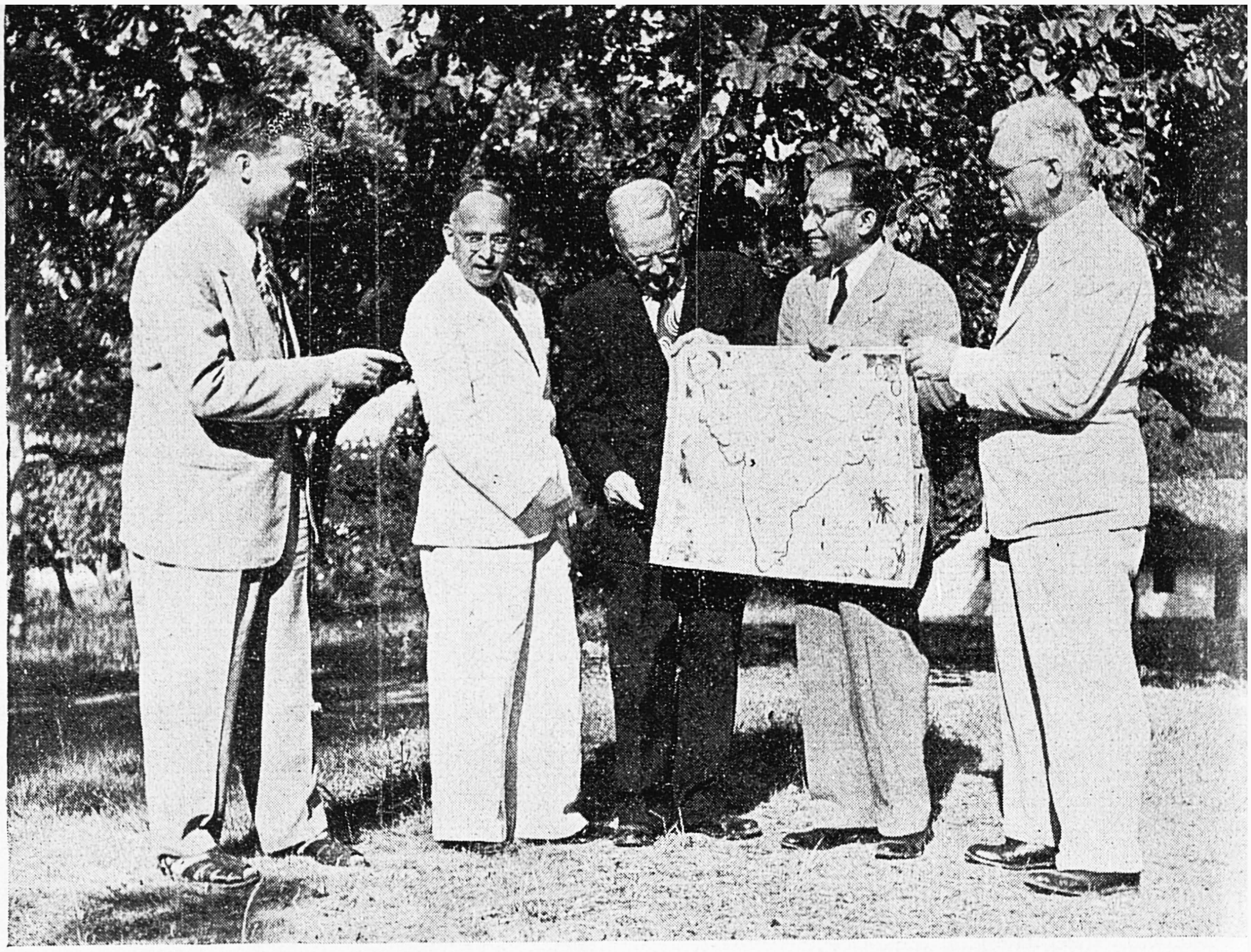
In conclusion let us review these rules for the blackboard:

Don't crowd the blackboard
Make working simple
Plan ahead of time
Collect all you will need
Check lighting
Use colour chalk for emphasis
Keep blackboard clean
Erase unrelated material
Print and draw on large scale
Try a chalk talk
Trace complicated designs by use of a projector.

In City or Village Classroom the 35 mm. filmstrip projector is playing a valued role in modern India.

There is no question of holding interest when audio-visual aids are used.





Four bishops of the Methodist Church in Southern Asia use a map to describe District work to a New York official.

Flannelgraph combines the power of a picture with the interest of a drama. Mrs. Duerkson and Miss Hetty Paul prepare a display at Raipur.

Chapter 19

FLANNELGRAPH

HETTY PAUL[1]

THE flannelgraph in its simplest form is a sheet of cardboard, ply or cloth covered board, other wood covered with flannel on one side. On this pictures or figures backed with flannel or other "fuzzy" material are placed. Because "flannel adheres to flannel" the pictures stick to the board as if by magic. As the teacher tells the story he places the relevant picture on the board to illustrate it. The story lives before the eyes of the children as scene after scene unfolds. Thus, simultaneously they hear and see the story.

The flannelgraph user must consider (1) the board, (2) backgrounds and (3) pictures or figures. In other words we have our stage, background and actors as in a stage play.

THE BOARD

The average size for a manageable board is 36″ x 27″. For large groups a board 4′ x 3′ might be advantageous. On the board of average size, figures 6″ x 8″ look best. A small board 12″ x 9″ utilizing tiny figures can conveniently be used with small groups, Sunday school classes or in hospital ward visitation. With this size board the teacher can hold it on his lap as he talks to the group.

The board may be made in one piece or, to make it more portable, in two pieces joined together by a hinge. (Fig. 1). Any kind of light wood or even cardboard could be used to make the board. Covered corrugated cardboard or an old discarded packing case will prove handy. If cardboard is used, the pieces could be joined together with a strip of flannel or other material about 2″ wide; care being taken to leave a small space between the boards when pasting the strip down.

If, however, a board is not available a school blackboard may be used; the background material being pinned on to the blackboard with thumb tacks or drawing pins.

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[1] Miss Hetty Paul, M.A., B.T., Nagpur, is a Secretary of the India Sunday School Union.

Failing this, an ordinary village bed or *charpoy* will serve the same purpose, if the flannel is tied to it. A rough cotton *sari* of a

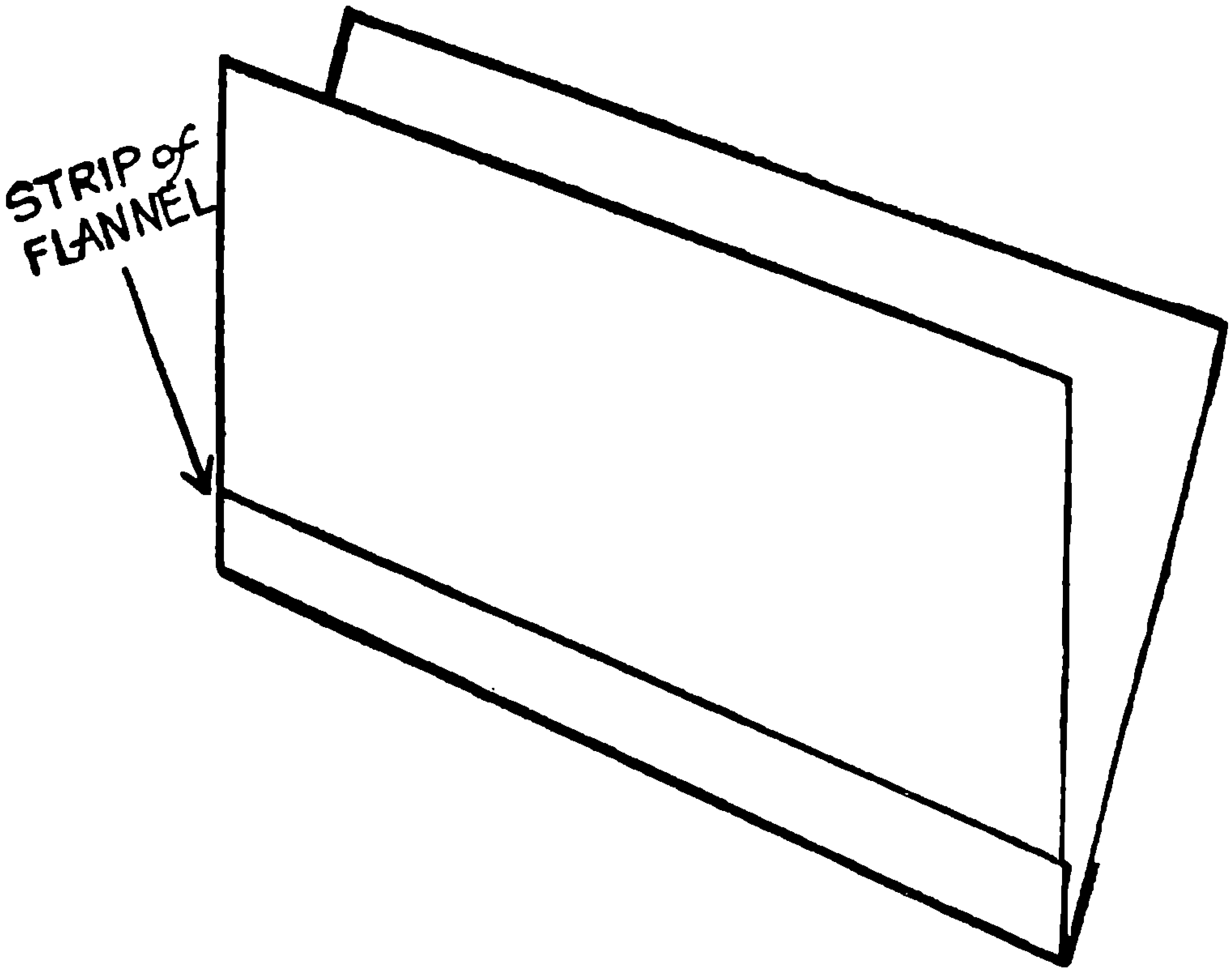

FIG. 1. A FLANNELGRAPH BOARD

dark colour may also be used; this has the added advantage of providing both board and background.

It is necessary that the board should be placed at a slight angle to prevent the pictures from slipping. It should also be protected

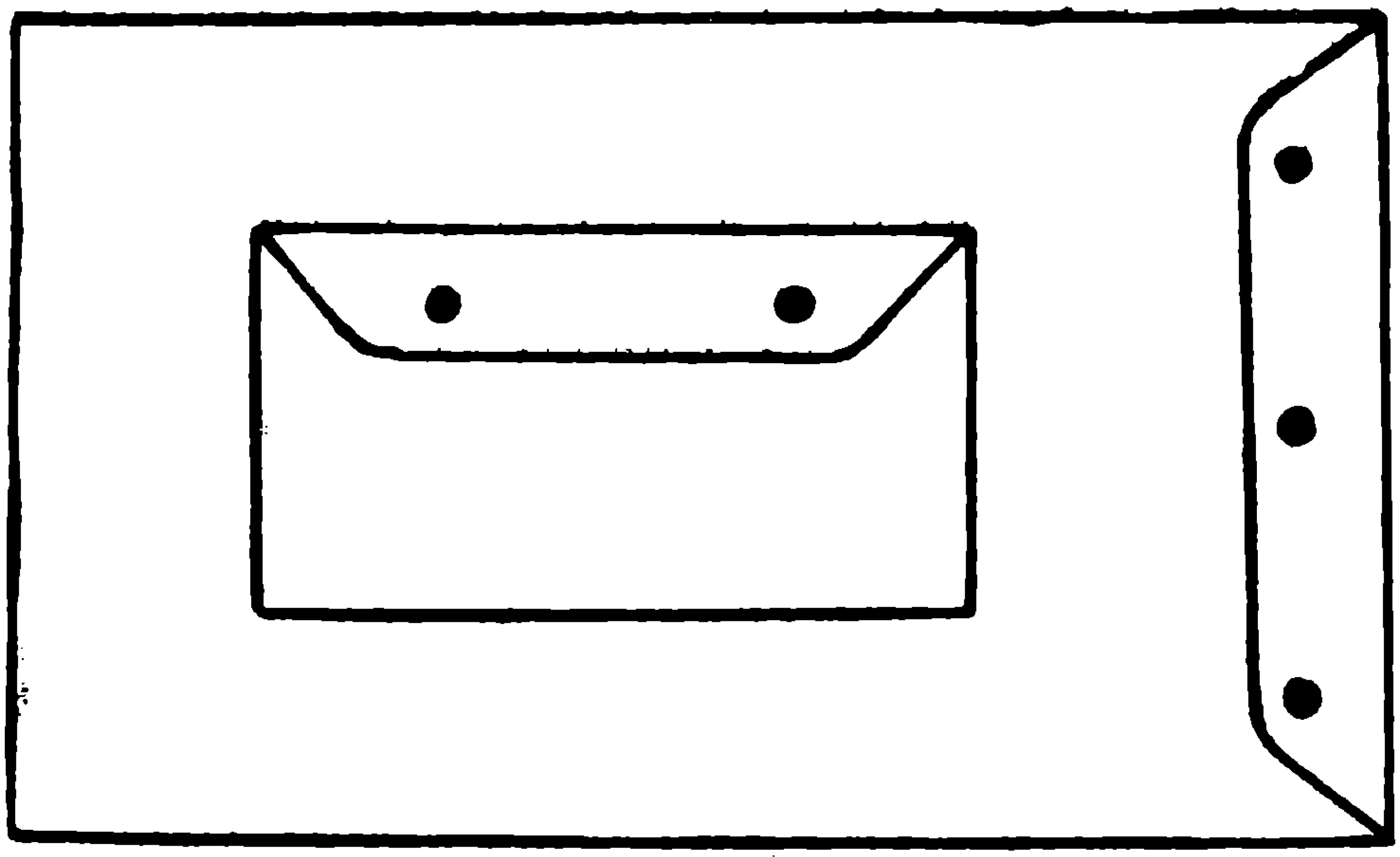

FIG. 2. A CLOTH CARRYING BAG

from strong winds. An easel may be fixed to the board or it may be placed against another object for support. If a *charpoy* (bed) is being used, it could be made to rest against another bed or a post or tree. A cloth carrying case will be useful on tour. (Fig. 2).

MATERIAL

Usually flannel or felt is considered the most suitable, but it has been found that less expensive material such as lint, mosquito-net, *garha, khaddar, dousute* and even rough mill cloth are equally effective. In fact, any material with a fluffy surface may be used with success. It is not necessary to use new material, scraps from old garments may be used, and it is wise to be on good terms with the family tailor because he can provide the necessary scraps of material at short notice.

BACKGROUND

By far the most useful background is a plain dark one. Some teachers prefer having the background material permanently fixed to the board, while others like to vary the colour. In either case it should be borne in mind that the background material should be stretched evenly across the board, and the fluffy side should be uppermost. The advantage of using a plain dark background is that nothing distracts from the characters of the story and also it makes symbolic lessons and memory work most effective.

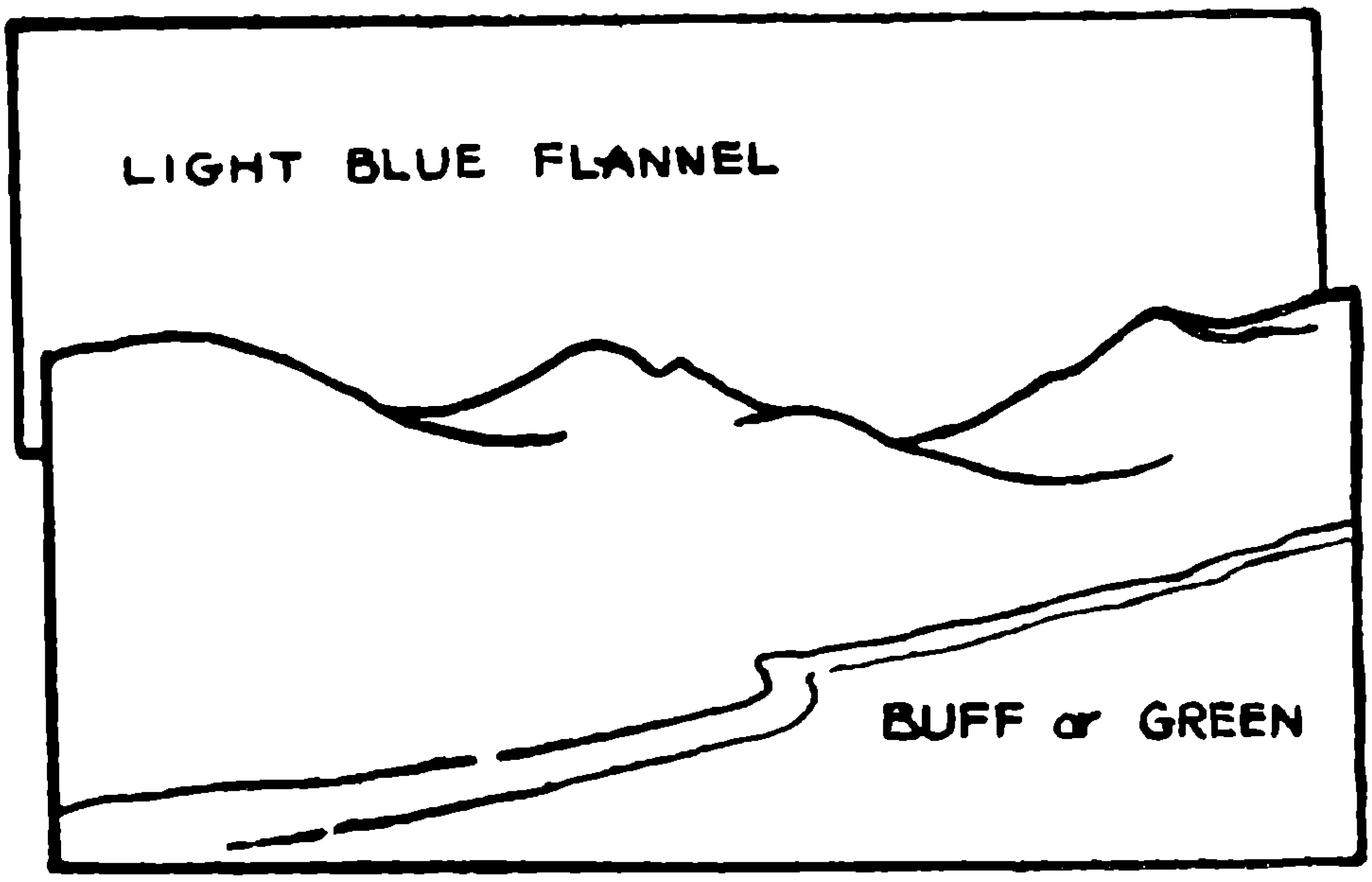

FIG. 3. BACKGROUND

Ready-made backgrounds are available in the market. These are, as a rule, attractively designed, but care must be taken to see that the background remains a background and does not divert the pupils' attention away from the story. They are too expensive for many to

buy so we prefer home-made backgrounds which everyone in an institute or workshop can produce.

Simple coloured backgrounds may be used very effectively. A strip of blue material placed across the top of the board forms the sky and a strip of green or brown below it represents the earth. (Fig. 3). Mountains can be made by cutting out to shape in purple, brown or green material or by simply placing a piece of wool in position on the board. Flowers may be cut out from coloured material, and

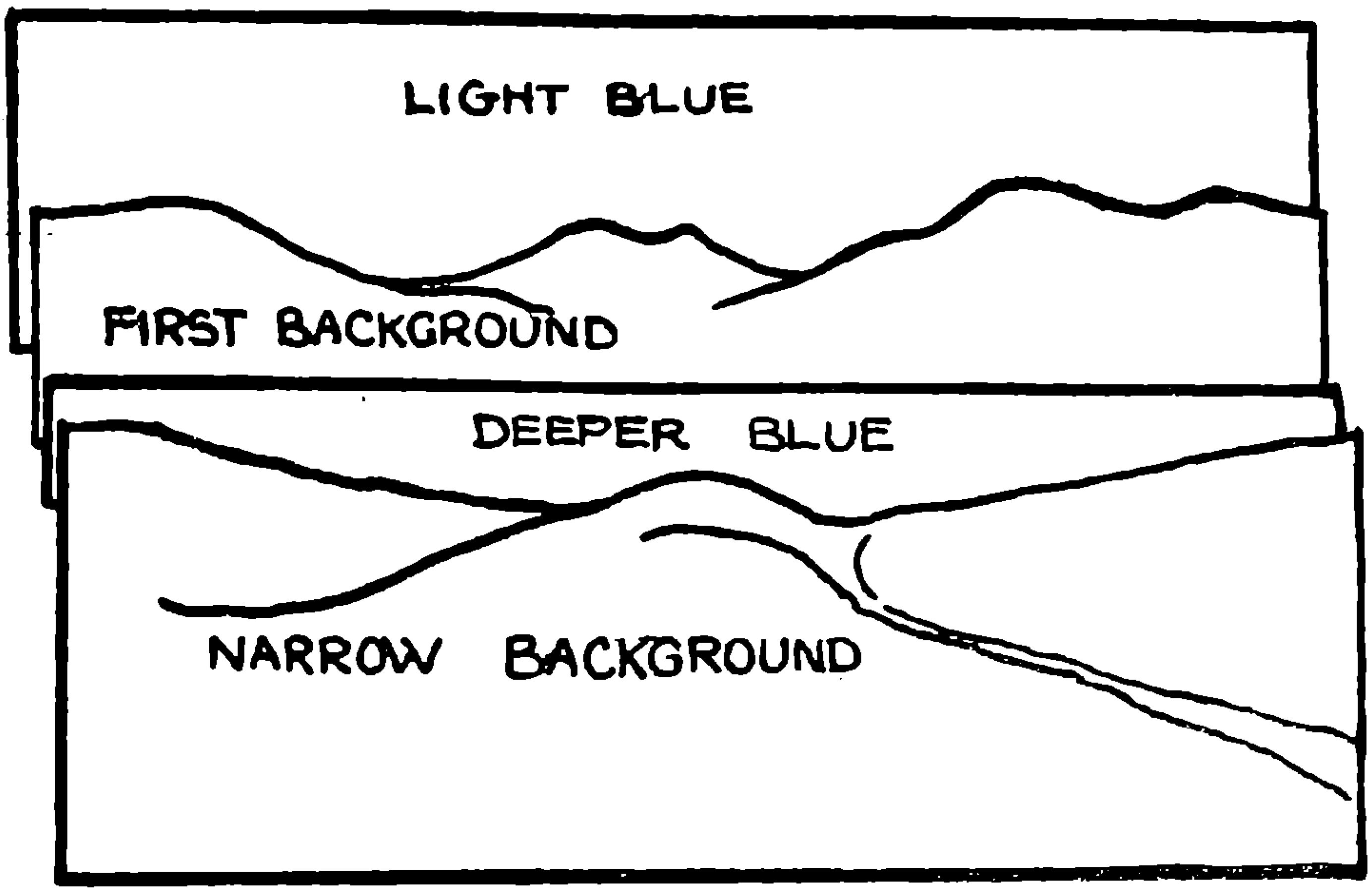

FIG. 4. "SEA OF GALILEE" BACKGROUND

small realistic touches like pebbles and bricks give a good finish to the picture. Crayon serves well for sketching both sides of the material for separate backgrounds. For example, one side could be sky and the other an interior scene. It is surprising to find how easily rivers, roads and seas are made by just cutting material to the desired shape. (Fig. 4).

PICTURES

Flannelgraph pictures in sets are available to be used according to the instructions given or they may be prepared by the teacher. Suitable pictures may be cut out of old religious calendars, magazines, picture books, etc. Pictures in black and white are improved by colouring. For this, water-paints, coloured ink or crayon may be used with great success. In most flannelgraph workshops the delegates begin with crayons and after some experience try to use water colours.

Backing the pictures deserves a word or two. The best thing to use for pasting is bazar gum. It gives excellent results when mixed with water. Material may be pasted to an entire sheet of pictures or

the picture could be cut out with a margin all around and then backed with material. The latter is more economical as less material would be required. Cut out the pictures when completely dry. It is wise to mark the back of the pictures for purposes of quick identification and to keep them under a weight when not in use. It saves time and trouble to keep the pictures in separate piles according to the stories they illustrate. The same pictures can, however, be used for different stories. For example, a picture of a group of people can be used in more than one story. The same applies to animals, objects and words. If the material frays at the edge of the pictures, all you need do is to dip your finger in gum and run it round the edge. It will be necessary to iron the background material and the pictures (under a fold of some thick material) if they get out of shape. If this is not done, the pictures will not adhere to the board.

HOW TO USE THE FLANNELGRAPH

To begin with, the teacher must be familiar with his story. Then, he must divide the story into scenes like a drama and arrange his pictures so that he will not fumble or hesitate while telling the story in class. When the board is placed at the correct angle, it should be covered with the background material; this being held firmly in place with drawing pins (thumb tacks). Then, as the story is told, the characters should be placed on the board at the right moment in the correct perspective. The secret of effective flannelgraph presentation is movement, and so, as far as possible the picture should be kept moving. Care should be taken to ensure that all the pupils can see the board. Frequently the teacher himself obstructs the view. He should stand to one side of the board. Here too, all the art of the story-teller is required. The voice of the teacher should suit the occasion and he must believe his story so that he can elaborate it, using vivid descriptions and interesting details. The children should also have their share in the flannelgraph. They can review a lesson taught to them by building up the scenes themselves. While a story is being taught they can also count the number of objects in a picture. For example, the five loaves and two fishes as these are placed on the board.

Besides being used for illustrating a story, the flannelgraph can be counted on for other purposes as well. Symbols, such as a cross or a heart used with a few key words make a talk to a group of senior children or adults come to life. Bible verses could be taught easily if certain words are replaced by pictures. For example, "Thy word is a lamp unto my feet" Word, lamp and feet are shown by placing pictures instead of words in position. The group could be asked to build up sentences, each word or picture being placed on the board by a different pupil.

Entire Scripture portions may be taught in this manner, e.g., Psalm 1:

Verse 1—Two figures walking, two standing and two sitting.
2—Picture of a Bible.
3—Picture of a green flourishing tree.
4—A man winnowing grain.
5—Family group reading the Bible.
6—A heart with Christ in the center—the end of a righteous walk.

Key words may be written in bold letters and used for teaching or reviewing.

Biographies are made interesting when emblems are used as they are taught.

Book studies like Miss Ranneys could also be taught this way for both younger and older children.

Map work also takes on a new meaning when done in flannelgraph.

Then black silhouettes—figures in simple outline form—placed on a contrasting background make a delightful variation to the flannelgraph story. If black paper is not available, white figures can be coloured with charcoal.

The colour film, "The Feltboard", opens up new uses of the flannelgraph in school. Numbers for arithmetic; circles, squares and segments for geometry; word lists for grammar; art pieces for physiotherapy; figures for stories; pieces for band and athletic contest formations; colour shapes for art classes are but a few examples of wider use of this aid. Every school room in India should have its flannelboard and each teacher should begin preparing aids for his subject.

SOURCES OF MATERIALS

1. Evangelical Literature Depot, 11/1 Mission Row, Calcutta.
2. India Sunday School Union, Coonoor, Nilgiris, South India.
3. Mission Press, Jubulpore, M.P.
4. Christian Book and Tract Society, 18 Clive Road, Allahabad 1.
5. Christian Literature Society, Post Box 501, Park Town, Madras.
6. National Christian Council, Audio-Visual Aid Office, Po. Agricultural Institute, Allahabad, U.P.
7. Lucknow Publishing House, 37 Cantonment Road, Lucknow, U.P.

Chapter 20

THE FIELD TRIP

DONALD F. EBRIGHT[1]

A FIELD trip, excursion or school trip is a planned visit to a point or points outside the regular classroom, church or institution. In every part of India there are glorious things to see. Protestant children can visit a Roman Catholic church. Christian children can visit Hindu, Muslim or Sikh shrines. Village children can visit a city; and city children can visit a village. In most communities there are: dairies, railway stations, fire depots, post offices, basic industries, courts, airports, libraries, hospitals, farms, rivers, etc., which will add to the knowledge of modern India and spark interest in civic problems.

In Chapter 2, Mr. Korteling discusses learning through experience. We learn through handling, tasting, feeling, seeing, smelling and hearing experiences. But we cannot always introduce a real-life experience into a church or school. It may be too small (i.e., an atom), too fast (i.e., jet bomber) or too dangerous (i.e., volcanic explosion) so that we rearrange the raw material and teach through models or film. Mr. Macnicol suggests in Chapter 21 that ideas and problems "come to life" through drama. Because it is not possible to do everything ourselves we learn a great deal by watching other people having first-hand experiences which we do on a field trip.

In a field trip the learners are observers. It may be that the members of the excursion will return to their church and vote upon a social service project or return to their classroom and carry out some of the activity they noted but these good actions are by-products. The field trip is a planned visit to an outside point. Miss E. Bradley, Moradabad, took a lorry load of Middle School girls to Naini Tal to study mountains, lakes, clouds, origin of streams and terrace forming. The senior students of Woodstock School visited New Delhi in September, 1954, to study persons, institutions and the organization of the Central Government of the Union of India. This April the

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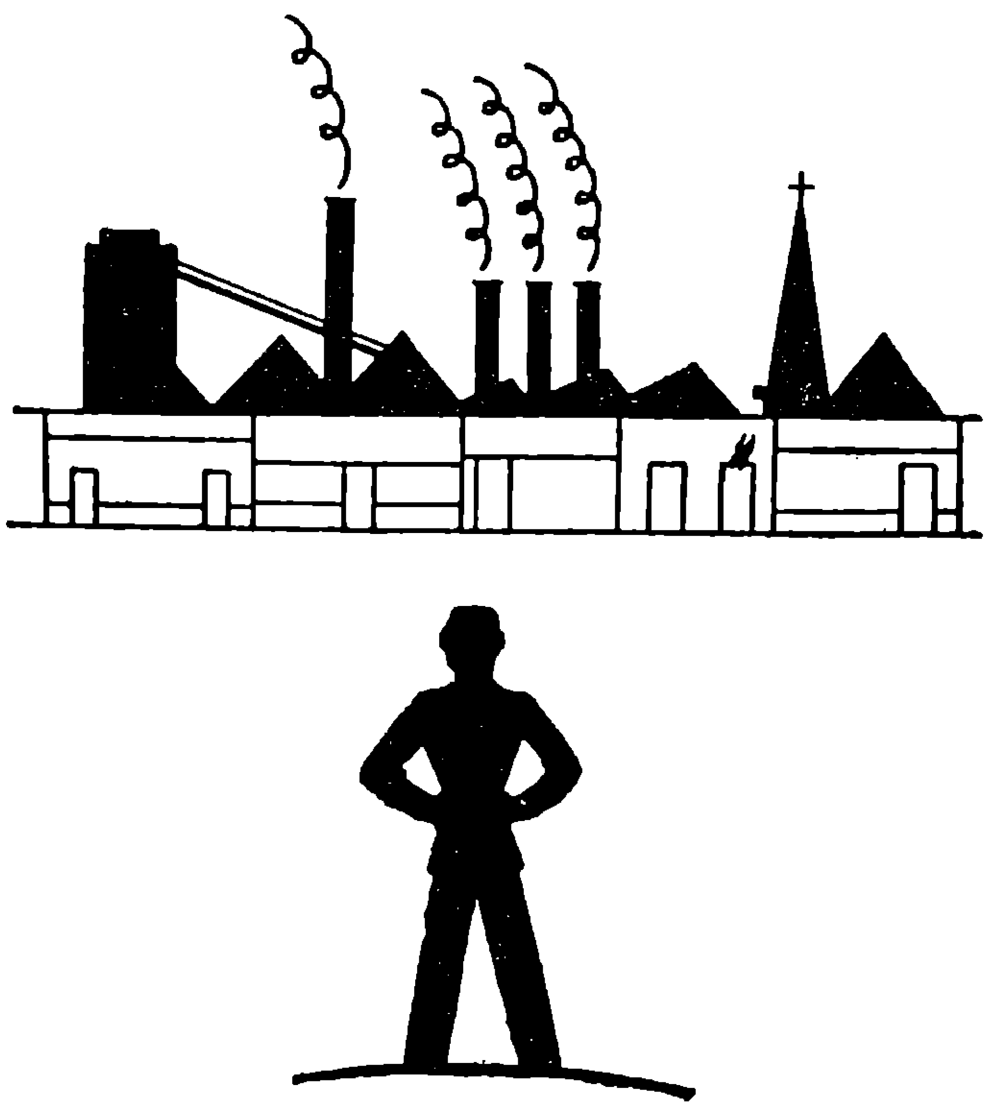
writer was in a Toda village in the Nilgiri Hills, South India, when two lorry loads (72 girls plus escort) of Bombay students arrived "to see the Todas" as part of a six weeks field trip in South India. Two years previously this Bombay school party visited East Africa. Miss C. Peters took a two-hour walking trip from the Lal Bagh Higher Secondary School to the banks of the monsoon flooded Gumti River to study erosion. So a field trip may be a short walk from the classroom to a river or a six weeks trip by ocean liner to Africa. What distinguishes a field trip is that the students get their experiences in the field and not in the classroom. It will succeed if it is well planned and is part of the total programme. It is a project to "look for things" and not "look at things"

What must the teacher do to plan a field trip? The major problems are: (1) purposes, (2) organization of the trip, and (3) evaluation. Field trips are not conducted to entertain the group, kill time during vacation or serve as a reward for high grades. The Moradabad field trip served as an introduction to a course in Social Studies. The Lal Bagh field trip was to review a unit on rivers and streams. The Woodstock sociology field trip was an integral part of a course.



It is no small job to organize a field trip. The leader must settle many problems which will not involve the class. He should:

(1) Make an itinerary with a list of situations and points of interest to visit.
(2) Get up a round-trip schedule.
(3) Decide who shall go.

(4) Obtain parental consent where necessary and school administration consent.
(5) Make arrangements with authorities at halting places to destination point.
(6) Plan transportation.
(7) Plan food and accommodation.
(8) Prepare budget.

When the place to visit has been selected the leader should write the person in charge and ask:

(1) Is a visit to your factory, plant, museum, institution, church, etc., possible?
(2) What day and hour are most convenient?
(3) Who will guide us through the place?
(4) Are any special precautions necessary?
(5) Is it possible for me to visit it alone before the field trip?

What is to be the means of transportation? The Woodstock party chartered a lorry for the trip from Kincraig to Delhi, used it for 107 miles of travel in Delhi and for the return trip. The Moradabad party chartered a lorry from the Uttar Pradesh Roadways for their trip to Naini Tal and return. Dak bungalows, railway station rest rooms, school hostels and mission bungalows offer ample facilities for overnight halts.

While the leader is organizing the trip he is also preparing the class. In the first place the class will make a list of things to look for which have arisen from their ongoing study. Some students will take notes to answer the questions. Some will use their camera for a pictorial record. A tape recorder is sometimes used to record on-the-spot impressions and data.

If the teacher keeps the following points in view the class will be ready for this learning experience:

(1) Create interest in the class through discussion, bulletin board display and library research.
(2) Outline problems the trip will help solve.
(3) Establish a clear purpose for the trip.
(4) Develop a background by consulting reference books.
(5) List specific points to observe.
(6) Set up the standards for safety and conduct.
(7) Distribute trip outlines in advance.

The leader would do well to distribute a mimeographed memorandum containing the following information:

(1) Name of Field Trip (Sociology Class New Delhi Field Trip)
(2) Where group will meet. (Parker Hall).
(3) Time (9.00 a.m., September 1, 1954).
(4) Transportation (Walk to Kincraig. Chartered lorry (bus) to New Delhi).

(5) Cost (Rs. 52 per student. Can be put on student's bill).

(6) Special Instructions:

(*a*) Bedding rolls and luggage to be ready at 7.00 a.m.

(*b*) Boiled water for flasks ready at 8.00 a.m.

(*c*) Box lunch will be served *en route*.

(*d*) Each student to have cholera, small-pox and typhoid inoculation documents.

(*e*) Carry Foreigner's Registration and Residential Permits for police.

(*f*) Have notebook and pens available at all times.

The journey to the destination can be an important part of the undertaking. If the trip is on foot the best route should be decided in advance and preferably checked by the teacher. If by car or lorry the leader should plan rest stops and make sure they are all together for each start. Indiscriminate eating of wayside food and unchecked drinking water are points to watch in India which do not arise in other countries. A first-aid kit is essential for overnight trips.

The field trip will be more effective if there is a list of things to look for. St. Joseph's School visited the All-India Radio Studio at Lucknow and each child had the following check-list:

What to look for:

(*a*) Studio

(*b*) Master Control Room

(*c*) Engineer

(*d*) Programme Director

(*e*) Musicians

(*f*) Announcer

(*g*) News Commentator

(*h*) Sound Effects Man

(*i*) Sound Effects Table

(*j*) Microphone

(*k*) Radio Hand Signals

(*l*) Transcription Table.

Why are field trips neglected in India? Inertia of teachers, reluctance of school officials to encourage such an activity, finances, problems of transportation, lack of time and fear of trouble along the way have been reported. It is true that a field trip will upset school routine, demand extra time and cost but this trouble will pay big dividends in terms of student learning.

Properly organized and conducted a field trip has tremendous advantages for many subjects. But if poorly handled it is a waste of time and money. We may summarize by saying:

(1) Avoid "spur of the moment" trips.

(2) Plan carefully including adequate supervision.

(3) Mimeograph guide sheets for the students.
(4) Prepare the students for what they are to see.
(5) Follow the set-plan and do not wander off on side-lines.
(6) Correlate trip with regular school subjects.
(7) Use visual aids to prepare the group, on the trip and in the follow-up activities which should grow out of the experience.
(8) Test students.
(9) Evaluate results of the trip.
(10) Make suggestions for subsequent trip to the same places.

The interest aroused by the trip should lead to effective use of pictures, films, slides and other materials in the church or school.

A camera record of the field trip has a pleasant experience associated with it. Photography on a trip is exciting for the taker and those having their picture taken. It also leads the students to look more closely at what they see. Older students can do the developing, printing, and enlarging for the classroom record.

Let us look at an actual school situation where a girl's school in North India includes field trips as part of its curriculum. Miss Edna Bradley of Moradabad writes that audio-visual aids have vitalized the teaching in her school. Asked what audio-visuals in education meant her Headmistress, Miss S. Sinha replied, "Audio-Visual education means the use of certain materials as an integral part of the educational process. Our plans must be child centered and well prepared, using audio-visual materials in an integrated programme of teaching experiences."

PLANNING FIELD TRIPS

At the risk of duplication let us look at some of the Programme Building suggestions prepared for the Teacher Training Class of this Moradabad school:

I. Scheduling Units:

A. Place Units at a time when *excursions* will be possible.

1. The village trip.
(We have found one of the harvest seasons best because the children are able to see the harvest activities.)
2. Transportation at a time when you can be certain that the girls will be able to visit shops and check the number of foreign goods in one or two shops. Then have them locate on a map the country from which wool, pens, medicine, radios, books, etc., came.
3. Rainy season insects as well as toads and frogs during the rainy season. I have seen teachers plan

to teach about frogs during January, and tomatoes during July.

4. There are subjects that can be fit into any period,
   (*a*) Children of other lands.
   (*b*) Shade trees.
   (*c*) Domesticated animals.

B. Files:

1. Materials are useless unless we know where to put our fingers on them when needed.
   (*a*) Every Headmistress knows what it means to have a teacher come for materials a few minutes before class time. (We may make rules that materials are to be taken from the supply cabinets on Saturday of the week previous to the lesson. Teachers will ask and expect the Headmistress to meet the need.)
2. Pictures to be used for projection should be filed and used for projection only. They are too small for classroom use.
   Bulletin board pictures and other material may be filed with table materials; and materials for panoramas and dioramas.
4. Pictures as well as articles in magazines should be filed so that reference can be made to them when needed.

II. Preparation:

A. Filmstrips, and Pictures should be studied and so arranged before the class arrives that there will not be mistakes made and long breaks in the programme.
   1. Correlation and integration is only possible when such planning is done.

B. Upper classes or training students may be invited to see programmes. Avoid calling children from the lower classes as they will be studying the same work the following year. Upper classes may make valuable use of the materials for review or for general knowledge.

III. Follow-up work:

A. Audio-visual materials are valuable aids for this part of the plan. Seat-work, consisting of posters, colouring pictures, other crafts will always help to bring the unit of work to a successful close.
   1. Bulletin boards are most worth while when the materials displayed are the children's own creation.

2. A completed thought or study may lead to:
   (*a*) Flower arrangements, collection of materials, or exhibits.

DETAILS OF A FIELD TRIP

Miss Bradley has had fine response from well-planned field trips in a Social Studies Unit, "Village Life", for the third and fourth classes.

She reports:

I. *Purpose:* To help the children:
   A. To appreciate the important part the Village holds in our Country (India).
   B. To understand the interdependence of Village and Urban Life.
   C. To understand the meaning of terms used in readers as well as in arithmetic classes: *village chaukidar* (watchman), *patwari* (land record keeper), *hud* (boundary) and *biga* (measure of land).
   D. To create an interest in the people and work of the Village.
   E. To put life and action in teaching and learning situations.

II. *Preparation:*
   A. Staff members planned the unit, knowing that much would need to be changed after the class visited the village.
   B. Visit to the Village by Staff only:
      1. To place the plans before the Village Leaders.
      2. We talked with each of the leaders and told them what we would like to have them do to help the children understand village life.
         (*a*) Sir-panch (Headman): We asked him to answer the children's letter when they wrote asking for permission to visit the village. (We had to supply the paper and a self-addressed envelope. We know that it would mean much to the children to hear from him.)
         (*b*) *Patwari's* map. We saw the map and located a *pakka biga* of land, and knew how it would be possible for the training students and upper class students to walk around the *hud,* while the teachers of third and fourth classes would be able to explain the meaning of the Patwari's map and locate more easily the boundaries.

(*c*) We explained to all the leaders that we wanted them to answer only the children's questions and not to go ahead of the children's plan.

C. Readers:·

1. The Third Class Social Studies Book and supplementary readers are very good. Thru the discussions the questions they wanted to ask the village leaders were easily framed.

D. We made our first contact with the Village through one of our servants who has relatives in the Village we were wanting to visit. We as a staff told the servant that we wanted him to suggest to the girls that they write a letter to the *Sir-panch* and to the *Village chaukidar.* The girls wrote to both and received answers from them.

III. *The Third Class invited the Fourth Class to join them on the trip.*

(It is impossible to take this trip every year and this makes it possible for the lower class to take the lead.)

A. After that for about two weeks the third and fourth classes met one period every day.

1. It developed a school spirit and co-operation between teachers and teachers and pupils as well as pupils and pupils.
2. All questions were prepared and assigned by the group.

IV. *The Trip was worth while:*

A. The *Sir-panch* took charge and was delighted to have part in teaching.

1. He called a *panchayet* meeting of 7 leading men.
2. He called the *Patwari, chaukidar* and night school teacher.

B. The *Patwari* showed the map and directed the tour to the Fields.

C. The Village *chaukidar* explained what his work is, showed the record books of births, marriages, court cases and reports to the District Office.

1. The children enjoyed reading their records.

D. The night school teacher told how many boys as well as men he taught at night who worked in the fields all day.

E. The visit to the Village School provided material for discussion in classes for a week. Every composition

told about the boys who wanted to study and had to work all day. Some added they had a good teacher.

V. *Outcomes:*

A. Appreciation of the courtesy shown by the Village people and leaders.

B. Appreciation of the work of the farmers and Village workers.

C. The Village has rules of health. Understanding of the work of the District Health Officers, Medical Officer and Magistrates.

D. Children appreciated the Village children at work and play.

E. Integration: The excursion and study provided worth while lessons in Reading, Social Studies, Arithmetic, Writing, (Compositions and letters. Every excursion creates Life Experiences.)

CLASS LETTERS AND MUSEUM

One outgrowth of the Moradabad field trips was to find "pen pals" in the places visited. It was but a step from the "pen pals" met on trips to another project to find "pen pals" in far-away places. The Social Studies Class wrote letters to children in many lands. As a result of the dolls, handwork and craft materials they received a very comprehensive museum was started. Upon receipt of a parcel from "pen pals" in India or foreign countries the Social Studies Class sent a box of dolls, toys, handwork and craft products from North India. It has proved to be a thrilling extension of the field trip. Here is a copy of one of the letters this class used:

Dear Pen Pal:

Your Country:

Can you depend on rivers and natural water ways or rains for the watering of your crops? We have excellent canals and wells in Uttar Pradesh. Do you have canals? If so, where do you get your water supply from? We get ours from the Ganges River and its tributaries.

Does your Provincial and District Government have an Agricultural Department which makes it possible for the farmers to obtain good seed and modern farming implements?

What is your hottest season? How hot does it get and for what period of time? Are your nights cool?

How cold are your winters? What months are the coldest?

How long does the rainy season last? When does it begin and end?

Tell us what trees you have, naming the shade trees, flowering trees and fruit trees. What trees are used for building and for furniture.

What wild flowers do you have and what flowers bloom in your gardens?

Homes:

Our Village homes in Uttar Pradesh are usually built so that the walls at the sides and sometimes at the back form the walls of our neighbouring homes. This is done for protection. Do you have such homes in your Villages?

Do you have grass roofs or tile roofs on your Village homes? Are the Village homes built of mud?

What food do you eat? How many meals do you have each day? Please tell us the names of the vegetables and grains you eat.

Tell us about the clothes you wear. If the sari is worn by some of the women please tell us how to put it on.

Do you have the family system?

Tell us about your family customs.

What social life do your women take part in?

Schools:

Do you have compulsory education for girls?

Is education for girls free? If not, what fees are charged for classes in the primary and junior high school grades? Classes I-V and VI-VIII.

Do you have good village schools?

Tell us what language the people of your Province speak. Please write a few lines or sentences in your language and tell us the meaning in Hindi or English. May I ask you to put that on a separate sheet so that we may be able to put it on the class room bulletin board. Thank you.

Please tell us how to play one or two games the children in your school enjoy playing.

What handwork or crafts are your girls and women interested in doing? Please send us a sample of the work you do, such as grass or palm leaf weaving, the making of lace or weaving. We in turn will gladly send you samples of the work our people do in the U.P.

Please give us the names of boys and girls in your school. Tell us what their names mean please. Our girls have names such as: Kamal meaning Lily or Asha meaning Hope.

We would like to write to the children in your school. Will

you please give us the names of some girls with their ages and the class they are in.

We are sending you the names of two of our girls. If you would like to write to them, they and their classmates will answer your letters. Please ask them questions about Uttar Pradesh (our state) that you would like them to answer.

1. Name..............................Age............Class............

2. Name..............................Age............Class............

Their address is: Methodist Girls' School
Moradabad, U.P.

I say thank you not only for myself and the staff and girls of our school but for the children of North India. Please answer our questions as soon as possible as we are wanting the information for our Teachers' Refresher Institute at the end of this month.

Thank you for all that you do for us.

Your Pen-Pal.

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Chapter 21

CHRISTIAN DRAMA

R. S. MACNICOL[1]

CHRISTIAN drama is more than a thousand years old. In the ancient town of St. Gallen in Switzerland, about A.D. 900, a song was composed and it was sung by characters representing the three women approaching the tomb of Jesus on Easter morning. The song of the women is answered by another character, an angel, who sings:

"He is not here, He is risen, as He said.
Go and say that he is risen from the tomb"

An ancient book gives the directions to the producer of the play. The monk who plays the part of the angel is to sit at the side, clad in an alb, holding a palm twig in his hand in a place representing the tomb. Three other monks wearing hooded cloaks and carrying censers are to come, as if seeking something, towards the tomb.

In the same ancient book we learn that this kind of drama is to be used "to fortify the unlearned people in their faith" Thus Christian drama, as a visual aid to faith was known and practised in the very early days of the church. It was used, in the days when the people were ignorant of Latin, as a means to convey the truth of the Gospel to the eye.

And this was, after all, only an extension of the central idea of the Mass which has been described as an acted parable. Here, before the eyes of the people, Christ's salvation is placarded for all to see:

For lo! between our sins and their reward
We set the passion of Thy Son our Lord.

So it is right and fitting that in our great work of demonstrating the meaning of the gospel in every land, we should use a language that is understood by all men, the language of drama. Today we have to re-discover the power of this shining instrument that has

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been known as a religious medium for so long in India, and make it speak to the needs and the longings of the people. It can be an unforgettable experience, the witnessing of a great drama, because it can speak to the heart as well as to the mind, and it can, by the appeal it makes to the eye leave a lasting impression on men's lives. It can be a powerful adjunct to preaching and to common worship.

Yet in one respect Christian drama is supremely difficult to achieve for it needs the co-operation of men and women who will not merely *pretend* for a time to be the characters they represent. The actors must always be men and women who, through the saving Grace of Christ, have experienced something of the truth that they are acting. The actor who plays Judas must know the depths of his own sin, his own betrayal of God's love. The actor who is Mary Magdalene cannot play the part sincerely unless she knows in her own heart what Christ has done for her. So there is a sense in which Christian drama is not acting at all; it is the discovery of our own needy hearts in the telling of the story. In Christian drama, more than anything else, sincerity is needed.

Drama groups formed for the purpose of producing Christian plays will, therefore, be ineffective, unreal, if the actors cannot say with quiet conviction, "I know that Christ is able to transform life: He has done so for me" And therefore, the first requisite of such a group is that it should accept the leadership of the Holy Spirit, in prayer and study of the Bible together. "Not unto us, O Lord, not unto us, but unto Thy name be the glory" Many plays have been wrecked because some actor was resentful at not being given a more prominent part; or someone has gone off in a huff because the producer criticized his speaking or his acting. That sort of situation will not produce Christian drama. It is the Holy Spirit who is our teacher. He will convict us of sin: He will guide us into the right way of speaking and of "holding forth the Word of Life" before all men.

This should remind us that Christian Drama is witness. It is evangelism. When Hamlet says:

"The play's the thing
Wherein I'll catch the conscience of the king",

He is expressing the conviction that a play can be something more than just entertainment: it can speak to the inner life of the spirit of man; yes, and it can speak so powerfully that a man who hears and sees it may never be the same again. This does not mean that a play should become a sermon, or that the actors should lecture to the audience. Many an otherwise good play has been ruined because it preaches and lectures, and fails to become drama. But a Christian play should so clearly demonstrate, dramatize, the power of the love of God when it meets evil and sin, that there will be a possibility of a corresponding conflict and victory in the lives of those who are in the audience "That which we have seen and heard declare we unto you, that you also may have fellowship with us"

A Christian drama group should be able to meet together as a fellowship in its day-to-day living. Six young men in a village, trained by the catechist or teacher could meet regularly to pray together and study and work together. Out of their fellowship can come the material for a play. Not many plays are available in print for such groups. And those that are available may not be suitable for a village production. So it is usually necessary for us to join together and make our own plays ourselves. Everyone has a part to play in studying the characters beforehand, in working out the dramatic conflict, the situation; but probably the final writing of the dialogue will have to be left to one person.

It is now generally agreed that Christian plays should not be in Bible language. In spite of the supreme beauty of the ancient speech, the use of it will not be natural to the actors or to the audience. And if our aim is to make Christ real to the people, then the Church must seek, as it has always done, to speak the natural language of the people. Only so will the truth make its impact with freshness and simplicity. This does not mean that we can never use the words of the Bible. On the contrary, they may be quoted with great force and effectiveness at the right time.

Let us imagine that a village drama group has planned to produce together with their leader on several occasions to study the passage in St. Luke. Under his leadership, they would begin by trying to analyze each of the main characters in the story. What kind of person is the father? Why does the younger son want to go out into the world? Are there any like him in the village? Is there a contrast between the two sons? Should we bring out the difference between the two servants? If we do, let us make sure that each one has a personality, each one a part to play. Are we going to introduce some humour into the story—and perhaps sympathy too!—by inviting some children to act as playful or hungry or affectionate pigs, surrounding the younger son?

Now the group must decide where the real conflict lies, in the play; for without conflict there is no drama. There is an outward

conflict between the two brothers. There is an inner conflict in the mind of each of them. How can we show it on the stage? The younger son has to "come to himself" and go and confess his wilfulness to his father. The elder son had to overcome his jealousy and remember his true relationship to his brother. Whatever be the subject of our plays. The conflict must be underlined and brought out on the stage both in word and in action. And a Christian play shows how that conflict can only be resolved by someone who "takes up his cross". Someone who is able to obey the Holy Spirit and change his attitude from pride into faith.

The third stage of the group's work will be the dividing of the story into scenes or acts. Should it be a one-act play, concentrating on one conflict with a simple climax? That might be appropriate for the story of Saul and David in the cave of Adullam, or the incident of Martha and Mary when Jesus visited them. But the story of the Prodigal Son falls more readily into three scenes; it begins in the younger son's home; it changes to the far country, where the swine are feeding; it returns to the home once more where the father awaits his son. There might have to be two parts to the last scene, divided perhaps by music and a dance, for there must be an interval between the coming of the younger son, and the moment when the elder son arrives back from his work.

In studying the story and building up the play, the drama group should think of the clash in home relationships that they know only too well: the tension between a patronizing, rather conservative elder brother, who has to bear much responsibility, and an impulsive, irresponsible younger brother who wants to go out and see the world. It is important to show that the father in the play is wise and tolerant, but he is not blind to the weaknesses of his younger son. The audience must keep their respect and sympathy for the father throughout.

The group must decide how many extra characters they need. It should never be necessary to depart from the main story (for instance, by introducing here a "love interest" in the shape of a bride for the younger brother!) but it might be an advantage to introduce some character to listen to the words "I will arise and go to my father". On the modern stage we do not use soliloquy because it is not realistic. Again, the servants have an important part to play both at the beginning and end. They can reflect by their action and their speech, the characters of the people they meet: the father and the two sons. They can help to heighten the climax, when the father and sons are reconciled.

When the group comes to the moment of production, every detail of the play has to be thought out carefully, and everyone has a part to play. Not every member will be an actor. One will be responsible for seeing that the costumes are ready; another will

take charge of properties and scenery; a third will look after the lighting; a fourth will pull the curtain if there is a curtain! And all these things are essential parts of the Christian witness of the performance, and should be accepted as such.

It is important to remember that the success of a play does not depend on the amount of money spent on it, or the elaborateness of make-up or scenery. It depends much more on the care and ingenuity of the drama group in using whatever materials are available. One such drama group in India works on a budget of four annas a month per member. This brings in quite enough money for the expenses necessary. Costumes can be home made, out of lengths of cloth or saries, and a little money spent on false hair, spirit gum and some powder. But the powder should never be used on the *face*! It is only necessary for the greying of the hair to suggest old age. It should be possible to give a first-class production of a play, anywhere, for not more than Rs. 25. Usually, much less than that will be needed.

But if a play is to be effective, two things are essential:

1. It must be acted so that every member of the audience can see without having to stand up. Therefore, there should be some kind of raised ground or platform, and ideally this should be at the foot of a gentle slope. It should not be impossible for an enthusiastic drama group to make their own outdoor stage on a flattened mound of earth not less than three feet high, beaten hard.

2. The play should be observed without any distraction. So a back cloth or screen should be provided, stretched between two firm posts; and the stage should be well lit with lamps that are completely screened from the audience. Kerosene tins are useful for this purpose, and if the inner side is polished, they make good reflectors. Apart from this, nothing else is essential, though a curtain may be helpful, and side-screens can conceal a prompter and mask the entrances of the actors.

In the training of young actors, certain fundamental principles must be remembered. *Every actor must be distinctly heard by the audience.* That does not mean we should fix microphones all round the stage, unless we are planning to act to an audience of several thousands! But it does mean that we should be willing to learn something about voice production, about how to enunciate clearly and breathe correctly. There is no need for an actor to shout. We learn to speak to the people in the back row, and always to face the audience when speaking. *Movement must always be natural, not exaggerated.* Normally, when an actor is speaking, he ought not to move; and those who are listening to him should keep perfectly still, except when they have to make some responsive movement. It is a bad fault of many youthful actors that they walk restlessly about the stage when they talk! *Exits should be natural also.* An actor

must have a good reason for leaving the stage, and he should succeed in making the audience wonder what he is going to do next, for it is suspense that keeps up the interest of the play.

The people of India have a natural gift for drama, and it is ready to be offered in the service of Christ and the church. Already all over the country, Christian plays are being produced, particularly at the great festivals of Christmas and of Easter. If in the villages and the schools and colleges, drama groups begin to be formed, the day will soon come when the Christian good news will be seen and heard by far more people than hitherto. We have to realize that the drama is not merely a pastime for children, an adjunct to the Sunday School, but also a living branch of the witness of the church. There will be Christian Drama Festivals, at which several groups will join together to produce a series of plays on special occasions. There will be travelling teams of Christian players who will go to the market places perhaps at the times of the great Hindu festivals, to preach through this medium as missionaries have done in the past. There will be more Schools of Christian Drama, at which representatives will gather together to learn better techniques and to pool their ideas.

But we must never forget that Christian drama is essentially an act of worship. It is the offering of the gifts of those who can sing and act to the God who gave these gifts, so that they may bring home to the hearts and minds of all people the mystery of the Incarnate life of God on earth.

Chapter 22

PUPPETS

ELEANOR FISHMAN[1]

THE art of puppetry is very ancient, both in the East and in the West. In recent years this art has gained great popularity in the United States both as the medium of instruction in day schools and Sunday schools and as professional entertainment and religious drama in cinema and television. There are several different kinds of puppets. This chapter will deal with hand puppets only and discuss their use in the programme of the Church in India.

It is our experience that hand puppets are more suitable for humorous sketches than for devotional presentations; therefore, we have used them mostly to teach some lesson on sanitation, health, home craft, stewardship, etc. The language used should be colloquial, and if amusing songs and dances are introduced both the teaching and the enjoyment will be increased. However, we have also used puppets in Sunday School for children to re-tell the story that they have just learned. Although we have not done so, we have heard that they have been used to tell Bible stories in villages.

VALUE OF PUPPETS

One may ask what values are there in puppets that are not found in regular drama. After using them for several years both in villages and towns we would like to mention four which have been apparent. (1) Since the parts are read no memorizing is necessary which makes it possible to present a play with only three or at the most four rehearsals. (2) The novelty of the figures will attract and hold a village audience and we have learned by asking questions after the play that truths are taught quickly. (3) Plays involving unusual characters such as demons, animals, vegetables, etc., can be more effectively produced by the use of puppets than by live characters. (4) A puppet play can be given quickly and with little trouble almost anywhere, particularly if a regular puppet stage is used. It is not necessary to have a large space for actors to play upon and the

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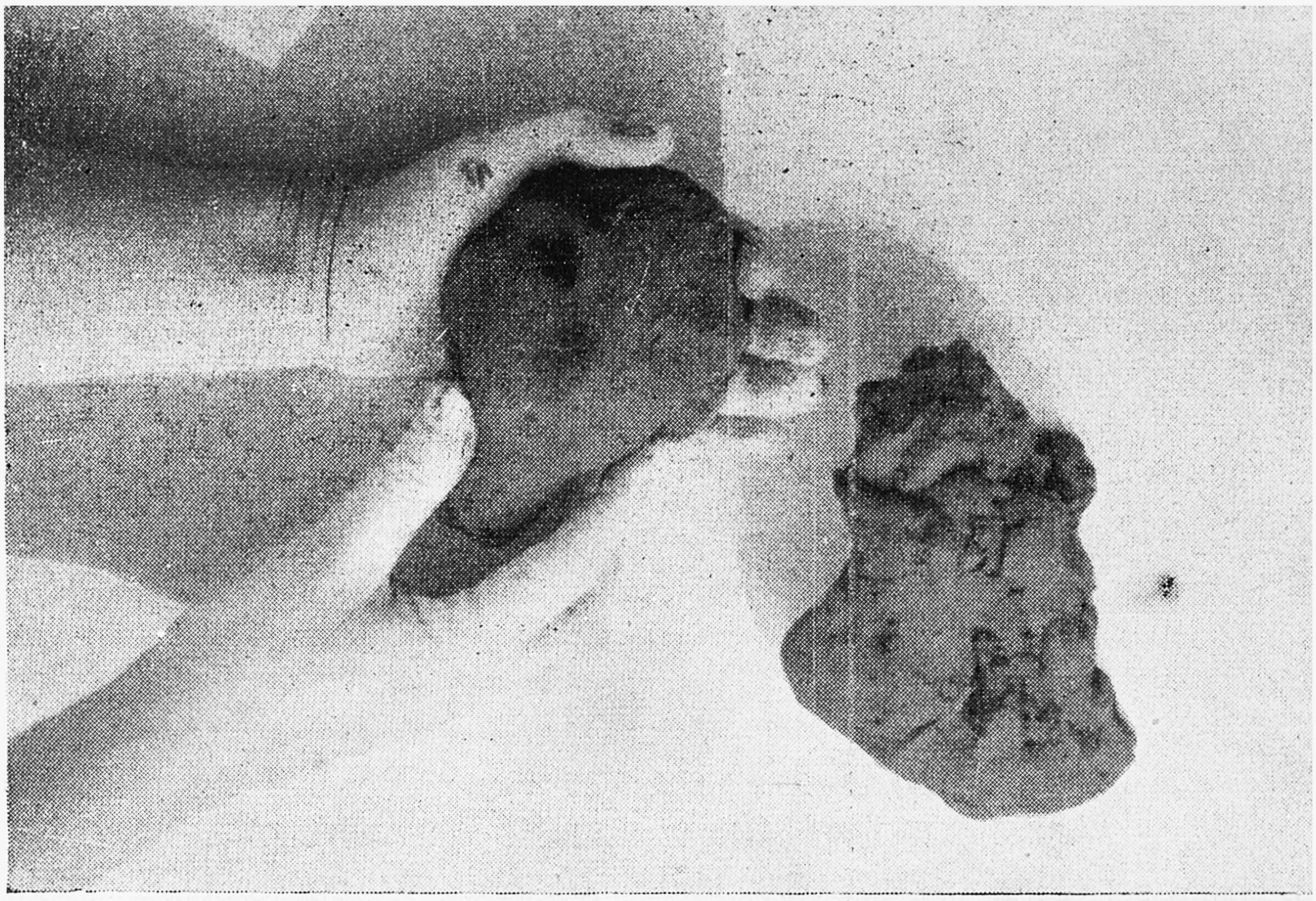
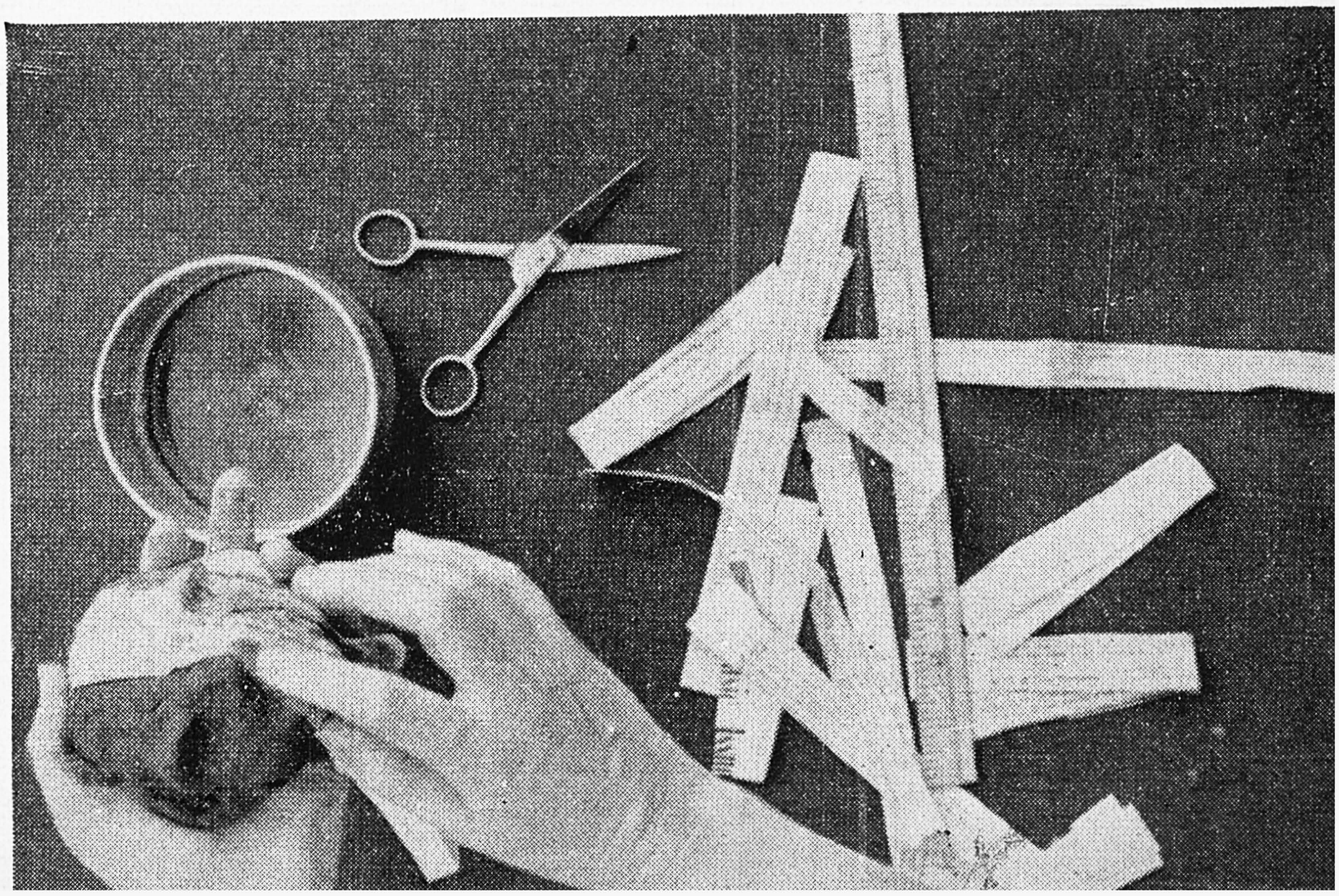
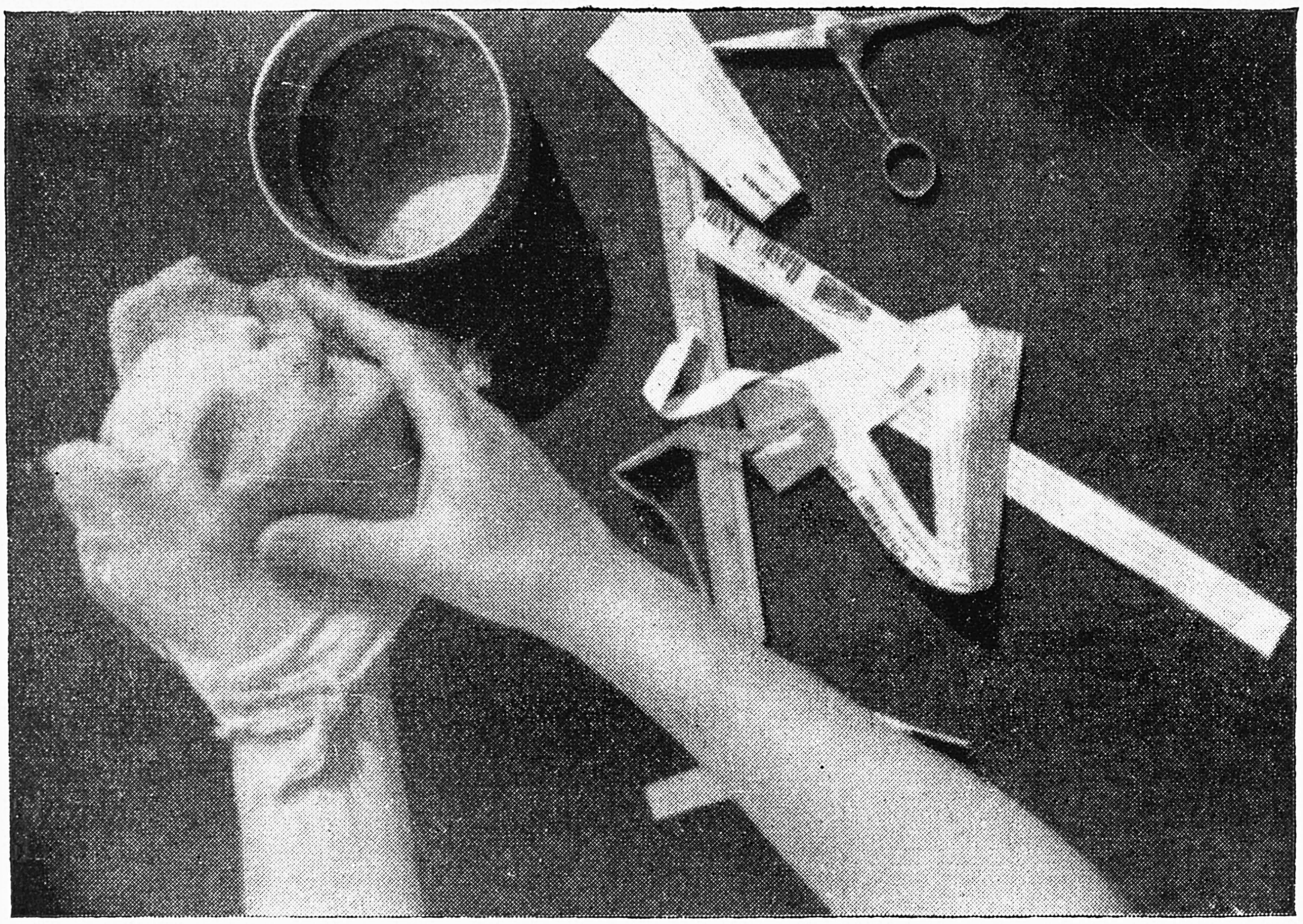
[1] Mrs. A. T. Fishman, B.A., American Baptist Telugu Mission, resides at Andhra Christian College, Guntur. She uses Audio-Visual Aids in village evangelism in Guntur Taluq.



Step No. 1. Mold the head with any molding clay. Dry and coat with a lubricant.

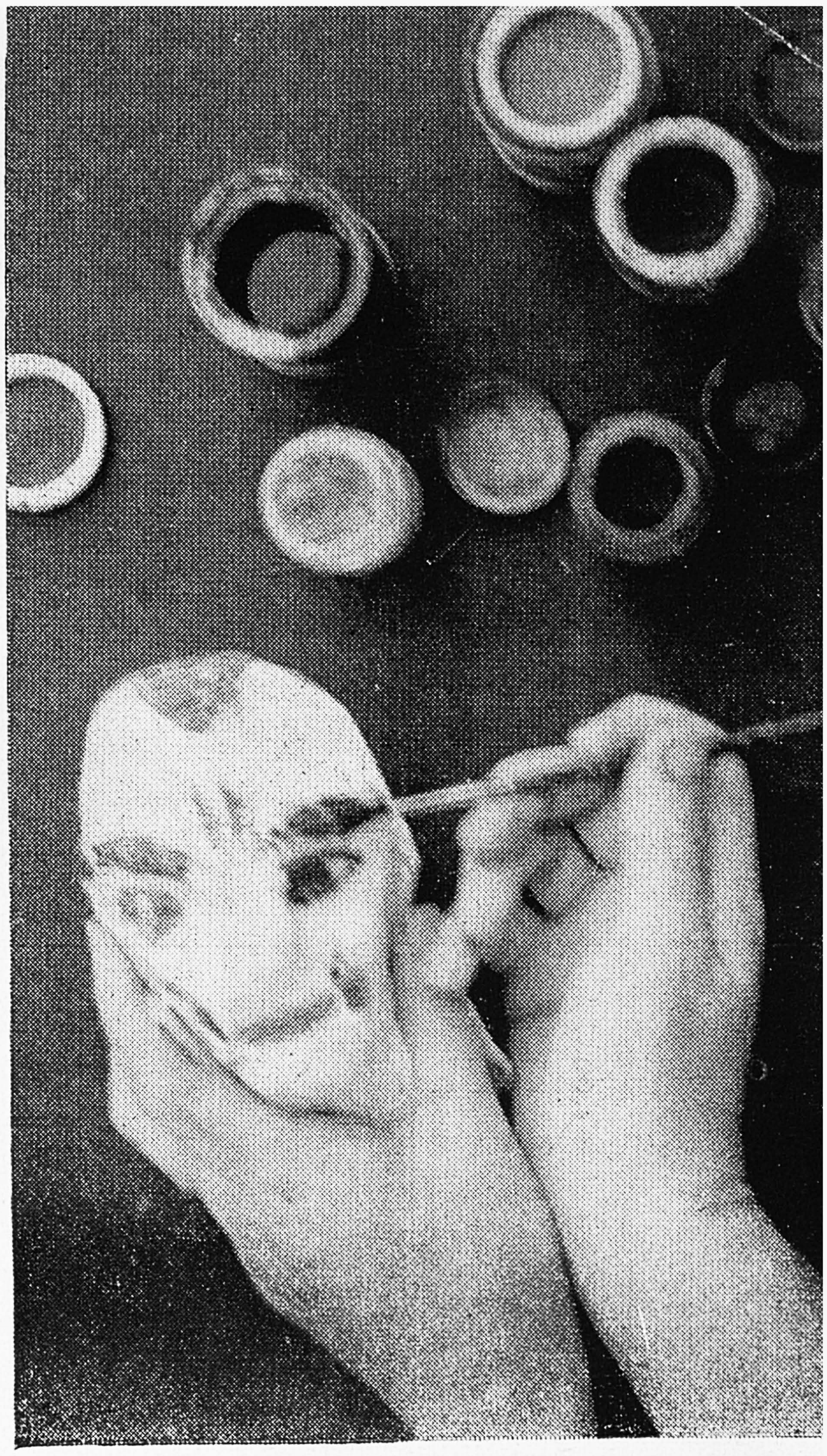
Step No. 2. Apply six layers of paper strips soaked in clay and glue mixture. Cover all with a piece of thin white cloth. Dry.



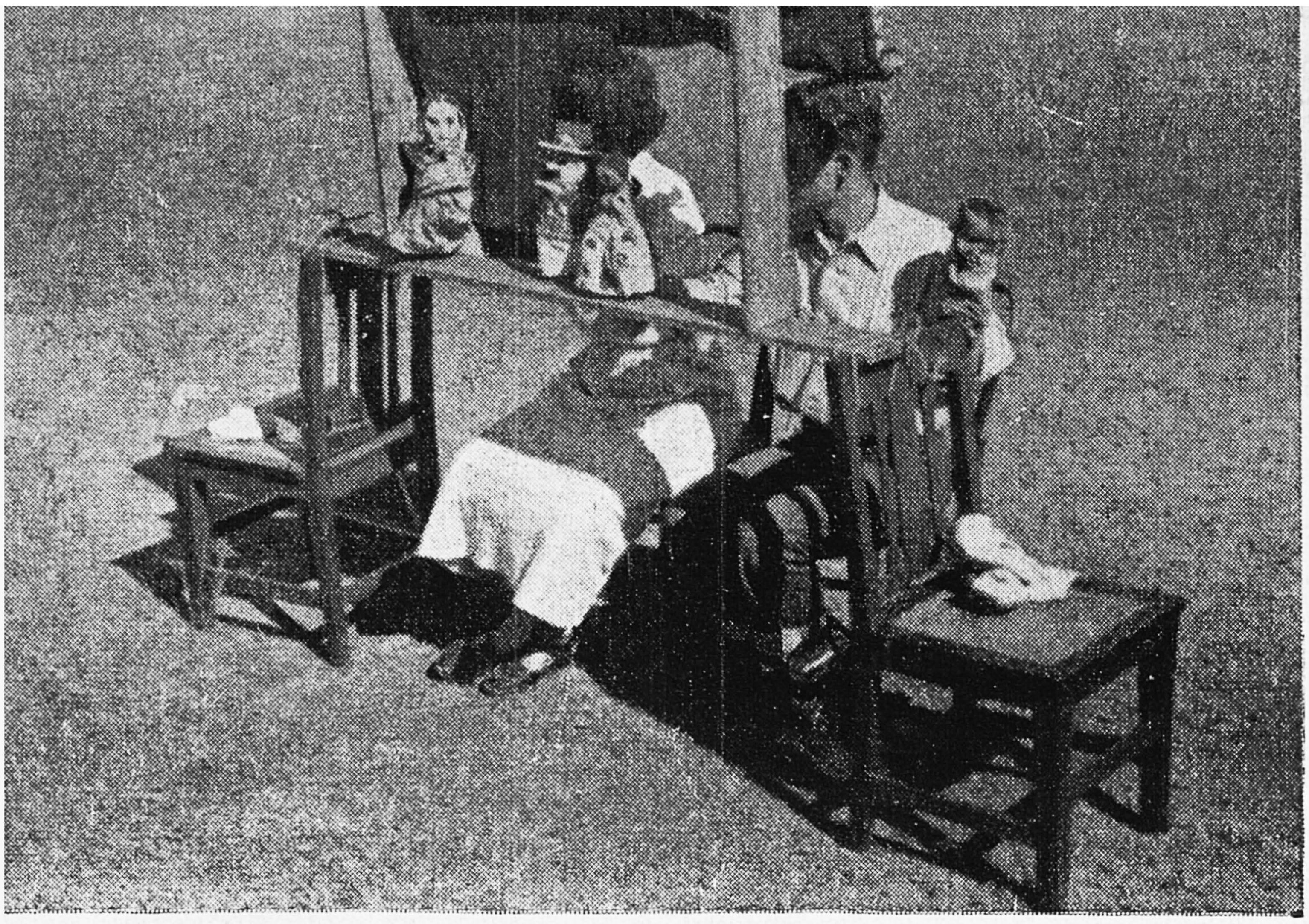


Step No. 3. Remove mask from clay head, sew and stuff.

Step No. 4. Paint face with a base color, when dry, paint in features and hair.

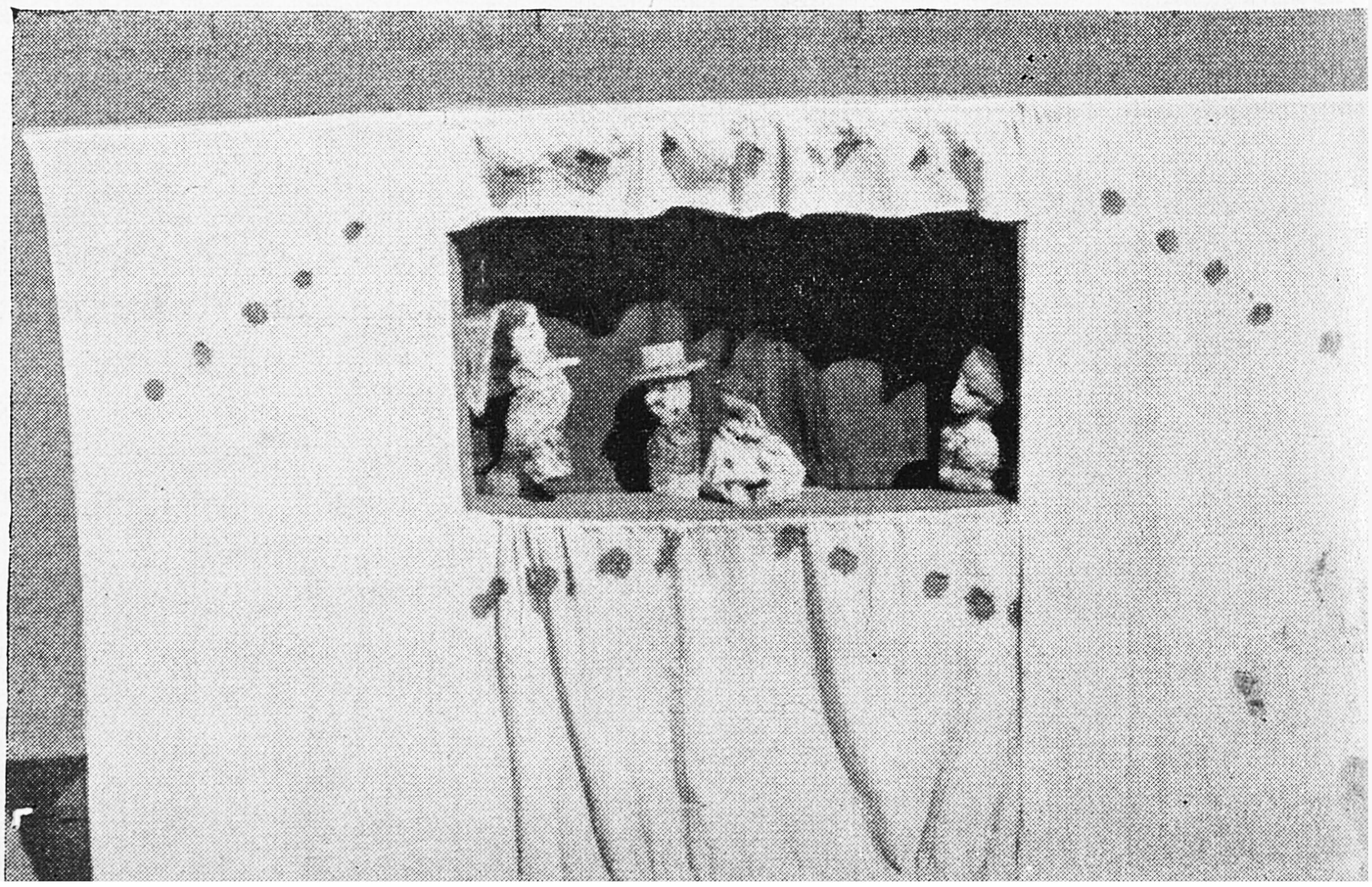


Step No. 5. Sew up a foundation garment to which any costume can be stitched.



Stage No. 1. Stage without curtains showing puppeteers operating puppets. One side of the back drop is rolled up.

Stage No. 2. Stage with curtains as it appears to the audience.



properties and setting can be realistically produced on the tiny stage. All that must be borrowed from the village are two chairs or two tables or two stools of more or less the same height. If you do not use a stage a table is all that you need along with the curtains which you carry yourself.

HOW TO MAKE

The simplest kind of a puppet head is made by stitching a cloth about 7″ by 4″ into a bag leaving the bottom open. Stitch darts into this cloth at neck opening and top to form an oval. Stuff this and shape like a head. If the cloth used is a fairly dark *khadar* (home spun cloth) the features can be painted directly on this without using a flesh colour as base. However, the method given below makes a much more realistic puppet and is the one we recommend wherever possible.

MATERIALS

Modelling clay (potter's clay will serve); vaseline or soap; paper strips about ½″ wide; paste, glue or acacia gum; thin white cloth such as cheese cloth or cheap voile; cotton or old cloth pieces for stuffing; needle and thread; bazaar dyes or water colours in yellow, white, red, black; paint brushes (substitutes can be made from feathers); cloth for dressing the heads.

PROCEDURE

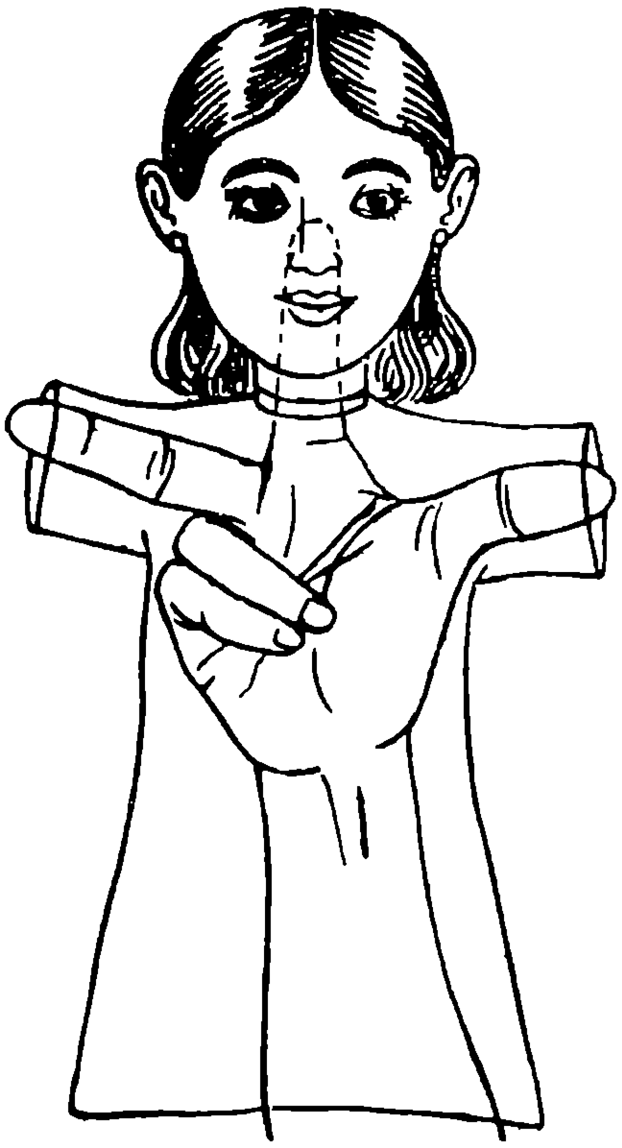
Step One. With a lump of clay in the palm of your hand model a head about as big as a good-sized mango and set aside to dry. The features should be very pronounced in order to compensate for the fact that the paper strips will tend to fill in the hollows of the eyes and smooth out the nose and chin. In general the proportions of a human face are as follows; the eyes half the distance between top of head and chin, nose half-way between eyes and chin, the mouth half-way between nose and chin. The features may be pinched out of the clay or small pieces may be added on to form the nose, eyebrows, forehead and chin. The ears are on a level with the eyes and mouth. Be sure to have a neck about an inch and a half long.

Step Two. Make a thick cream of clay, water and a little gum. If a very dark clay is used it is better to have a flour paste mixture instead of clay. When the head is firm, grease the face well with vaseline or soap as far back as the ears. Dip paper strip in the clay mixture and apply to the front half of the head, making sure to include the ears. Press firmly into all depressions in the mould so that the features will stand out well. Apply six coats of paper strips. Take a piece of white cloth big enough to cover the entire head with sufficient extra for a seam at the back. Apply this over the last layer

of paper, smoothing it in carefully and pressing it firmly into all depressions. Set aside to dry.

Step Three. When the paper and cloth mask is completely dry and hard, it can be easily removed from the clay mould and the mould set aside for future use. Take the paper and cloth head, stuff it with cotton or cloth scraps and sew it up at the back, rounding it out to look like the back of a head and tucking it in at the neck. Leave at the neck a hole large enough to admit the index finger.

Step Four. Blend the white, red, and yellow dyes into a flesh colour; only a touch of red and yellow will be needed as features



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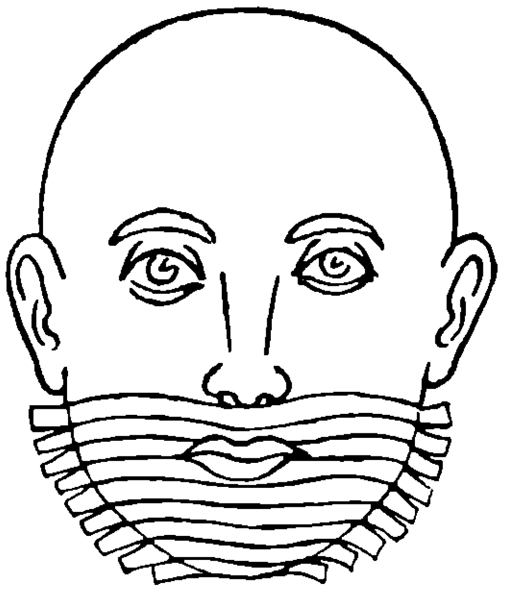

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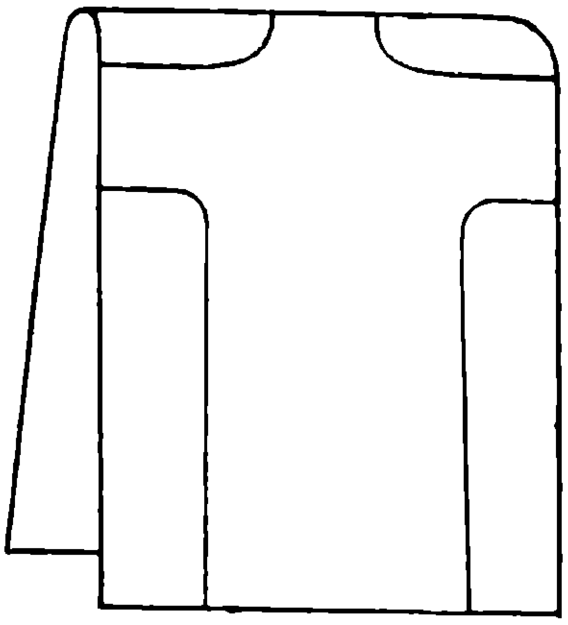

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will not show up on faces that are too dark. Paint the entire face and neck with this colour; paint the hair black. After the face colour has set, paint in the features, using black for eyes and brows and red for mouth. The features should be fairly large and heavy in order to show clearly from a distance. Hair, moustaches, and beards may be made of cotton, wool or crepe hair and stitched on if desired.

Step Five. Sew a bag large enough to admit the first and long enough to be in proportion to the size of the head. Leave a hole at the top into which the neck of the puppet must be fitted. Leave two holes, one on each side, large enough to admit the thumb and middle finger which form the arms of the puppet. Upon this

foundation garment the costume may be sewn, but if you desire a more realistic figure, legs and hands may be fastened upon it as illustrated. Using your eye to judge the proportions, cut lets and hands of the same material as the foundation garment, stuff and attach. The puppet is now ready to dress in any costume that suits your play.

HOW TO MANIPULATE

The head fits on the index finger, the thumb and middle finger are the arms and the fist hidden within the clothes is the body. Everyone must experiment for himself how to nod the head, wave the arms or pick up properties. Walking is shown by a circular motion of the wrist and arm. Dance movements can be nicely worked out. The top of a table will serve for the simplest kind of a stage with the puppeteers hidden behind a cloth. The puppeteers may do the conversation or additional readers may be used. If the latter course is followed, place the readers in front of the table-stage behind a screen. The whole set-up can be arranged with the use of a table and two or three saris. More elaborate miniature theatres with curtains and back drops can be made and add a great deal to the natural effect of the drama.

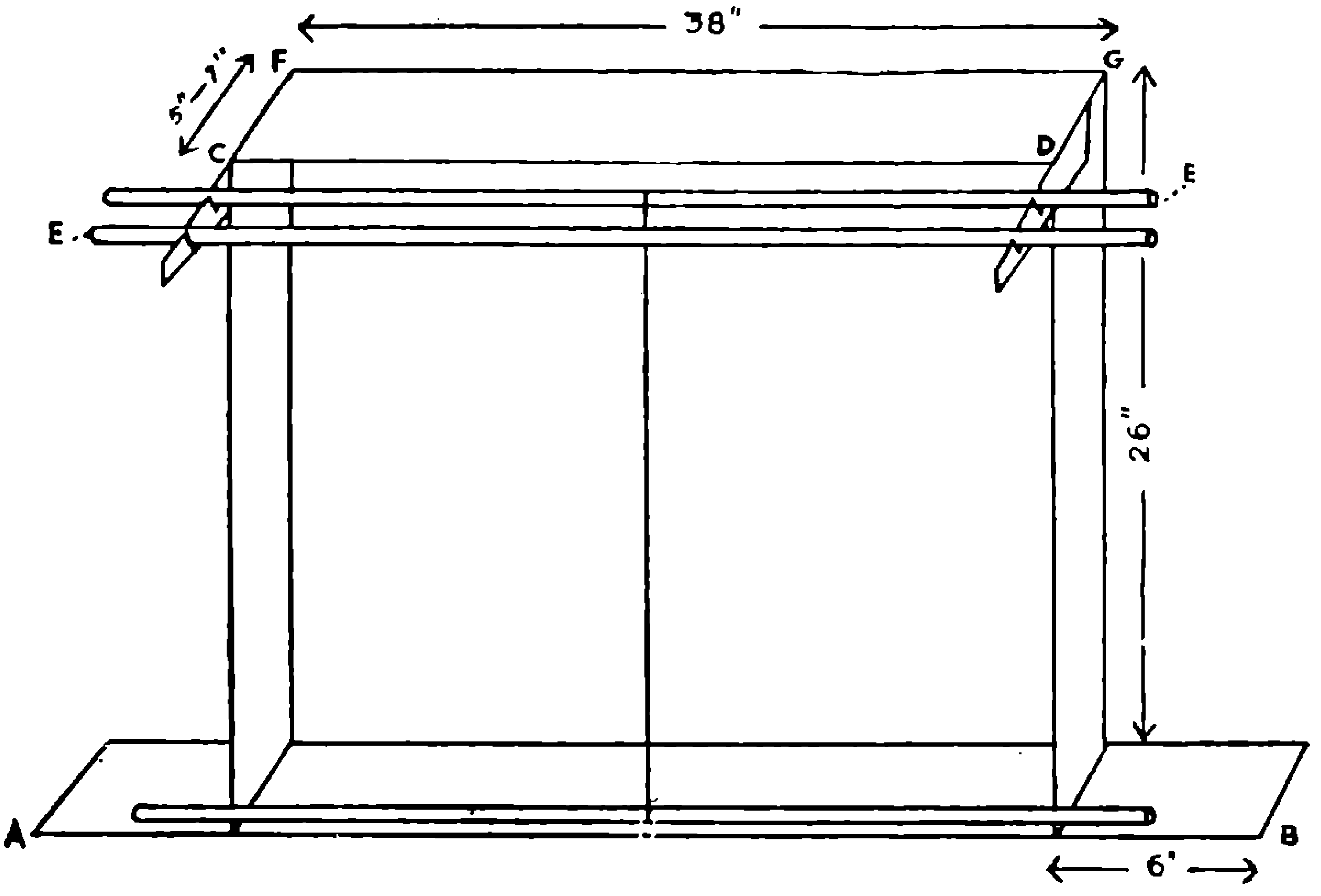

Fig. 1

Make a frame as illustrated in Fig. 1 of any light wood 26" by 38" and between 5" and 7" deep. The lower edge of the frame (AB) should extend about 6" on either side to enable the frame to rest firmly between two boxes, tables or chairs. On the top, at the back of this frame at (CD) nail two brackets extending beyond the

frame about 6″ and cut two notches in each for poles E 44″ long to rest in. Back drops are hung from these poles.

For back drops take two pieces of thin cloth any colour suitable to your play as in sketch Fig. 2 24″ by 30″, and sew a 2″ hem at top and bottom making curtains 14″ by 16″. Insert poles into each hem as illustrated. Tie strings to top and hang them from poles (E), one on each pole overlapping inside edges 2″ at centre and tying outside edges an inch or two outside of brackets. This gives you

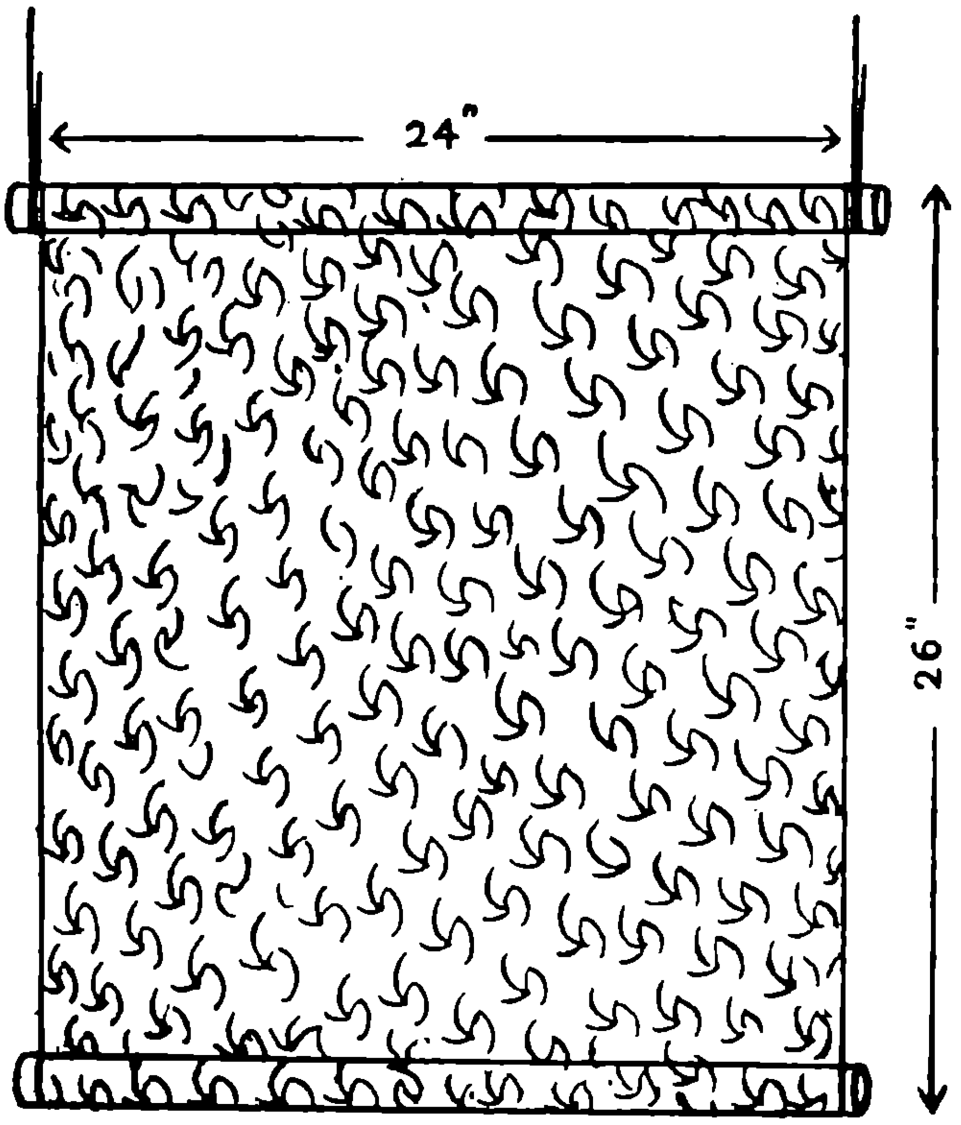

Fig. 2

a centre opening for puppet entrances. Any scenery desired may be sketched on these back drops.

On the front of the frame at (FG) in Fig. 3 fasten two 2″ nails to hold pole (H) 89″ long. Sew two curtains (I) 26″ wide and 58″ long with a two-inch hem at top and bottom for insertion of poles. Sew a valance 9″ wide and about 50″ long with a two-inch hem at top and insert pole (H) leaving a ruffle valance as illustrated. Sew a fourth curtain (J) 38″ by 28″ with a two-inch hem at bottom and a one-inch hem at top. At top insert an expandable curtain wire or string and fasten it securely across bottom of frame at (KL) and underneath curtains (I). Now insert pole (M) 89″ long thru bottoms of curtains (I) and (J) as illustrated. You now have a stage opening F G K L framed by curtains and valance. The curtains extending beyond and below your stage hide the puppeteers and readers from the audience. The whole stage can be easily dismantled and reassembled. Do not rest it on a table but between two tables,

chairs or stools. The curtains should not be too highly coloured or decorated as this would distract from the puppets. White is suggested as it will lend themselves to discreet decoration which can be changed from time to time.

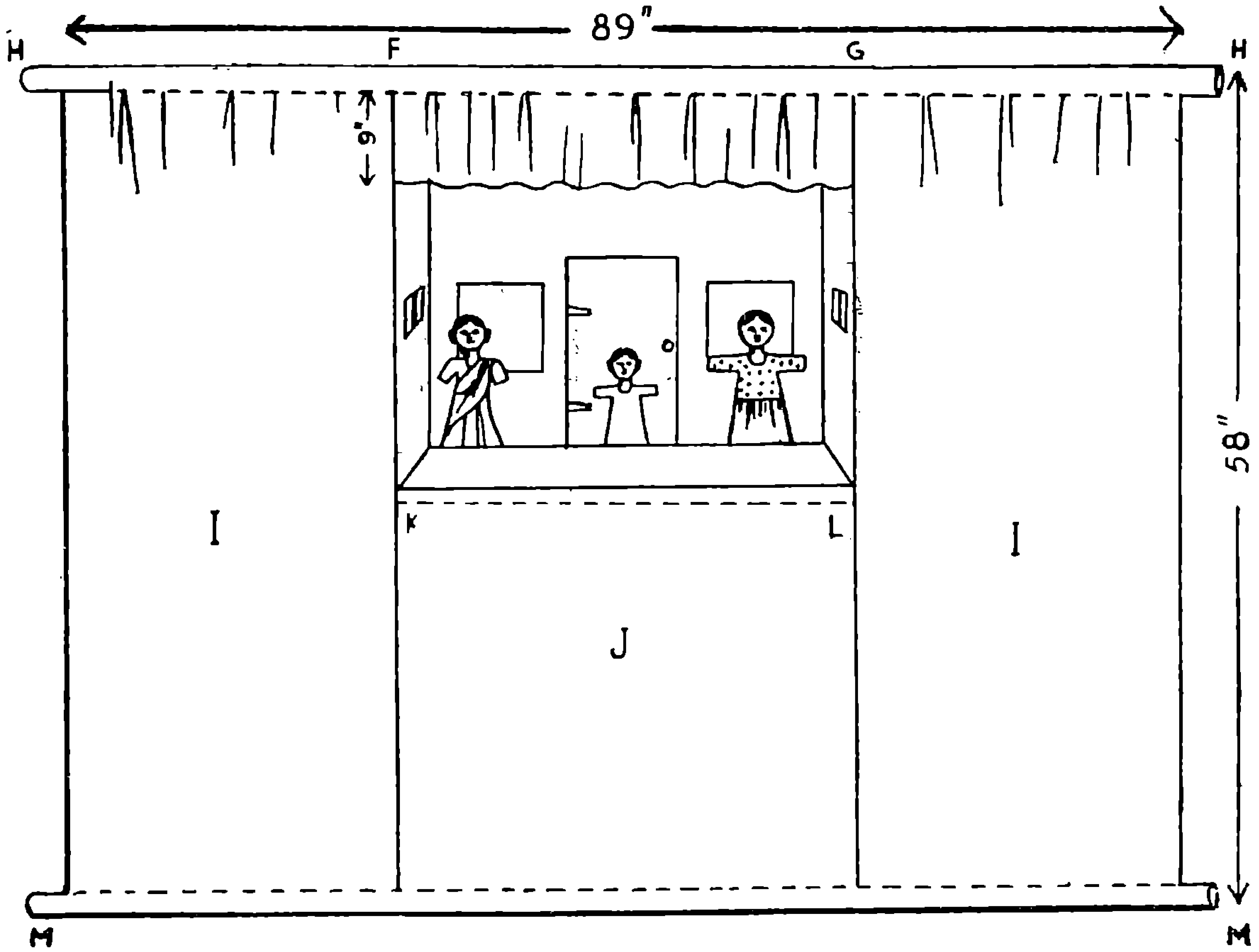

Fig. 3

Front curtains may be made if you wish to elaborate the stage, Fig. 4 shows a typical pull curtain, which opens in the centre and pulls out of sight at the sides of the proscenium. A metal rod or light-weight traveller can be used to carry the curtain, which can either have rings sewed permanently to the cloth or hooks which slip into rings on the rod or traveller. To rig such a curtain, hang the two parts on the rod and close, making sure they meet in the centre. Fasten them together temporarily. Take a length of rope long enough to reach from the bottom of your curtain on the right to screw eye (4) and back again. Fasten one end of the rope at (I), run through screw eye (2) and tie off at second ring (3) of left curtain, so it will overlap. Continue the cord through screw eye (4), bring it back to (5) on the right curtain and tie. Between points (3) and (5), the rope should be taut. Carry the rope through screw eye (6), the two loose ends can be knotted together or passed through a wooden bead or ball heavy enough to keep the ropes taut when the curtain is open.

The stage may be made to fold up as follows: Fix 4 $2\frac{1}{2}''$ butt hinges at the four inside corners of the stage (*a*). Fix 2 $2\frac{1}{2}''$ butt hinges at (*b*) on the outside. Fix 2 6″ hooks as indicated. Pivot the back drop brackets with one bolt each as indicated at (*c*). Drill a small slanting hole in the front end of each bracket at (*d*) for the insertion of a nail to hold the front curtain pole. Drill two

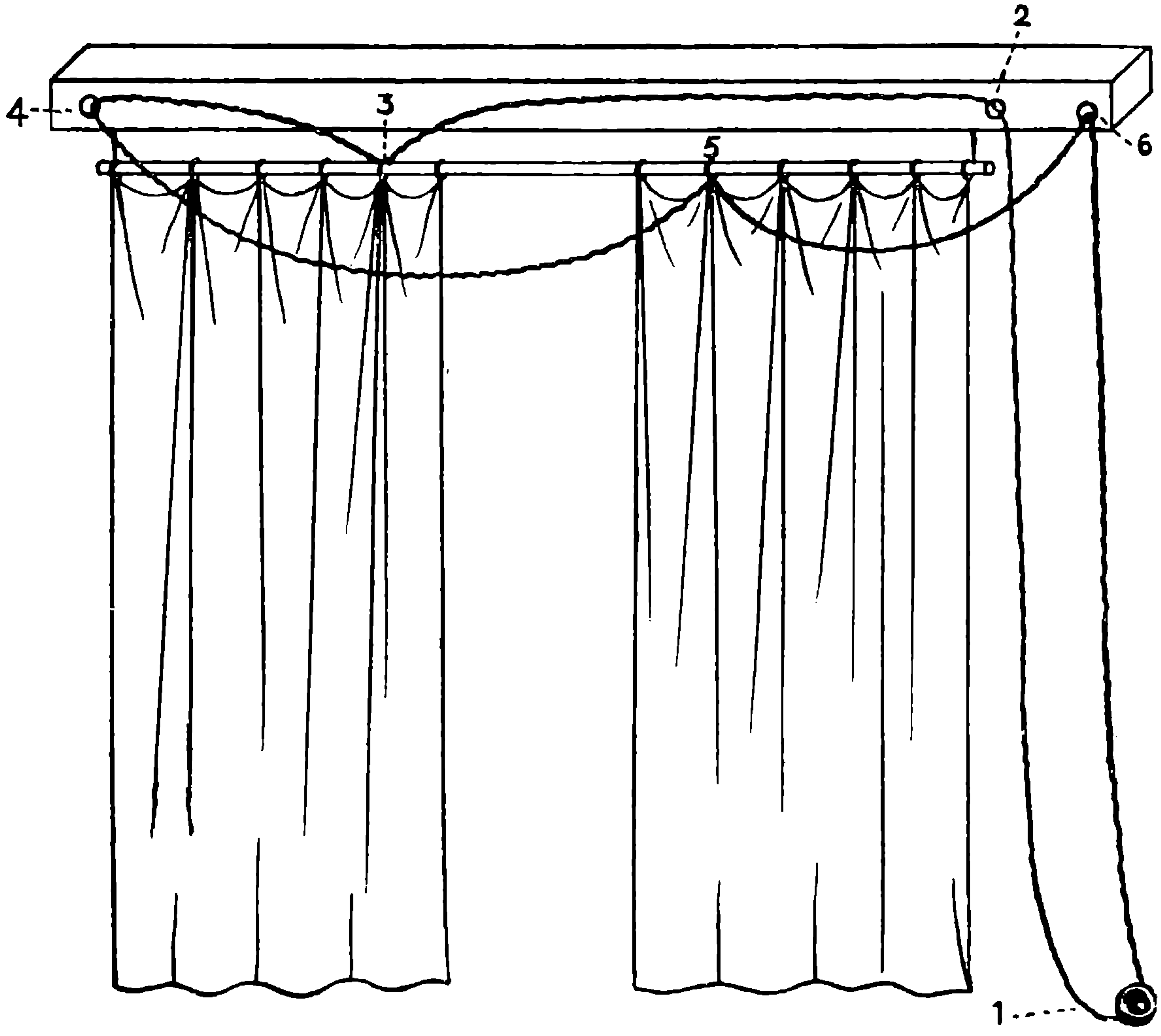

Fig. 4

holes at (*e*) to take cords for tying the stage firmly to chair backs or other suitable supports. To fold the stage, release the two hooks and allow it to collapse as indicated. Turn the two back drop brackets in. Now the stage forms a package 4″ by 5″ by 50″. The poles inserted through the top and bottom of the curtains can be made to fold up by using a tent pole joint. Cut the 89″ poles shown in Fig. 3 in two. Fasten a metal tube to one end of one half, shave one end of the other half so that it fits snugly into this tube. In order to save the metal tube from damage when the stage is not set up, insert a snug fitting stick,

Chapter 23

OPAQUE PROJECTION

IRIS WILSON[1]

THE opaque projector is one of the most versatile of all the audio-visual tools for the church and school. The imaginative and creative teacher will have a large variety of projection materials available at the least expense when this machine is used, Yes, and opaque projector can project onto a screen any non-transparent picture including photographs, pictures from magazines and newspapers, postcards, hand-written material, maps, sketches, coin collections, cloth samples, etc. Just what is this projector?

The opaque projector is known by various names. Americans will refer to their "Spencer Delineascope" or their "Baloptican". British will speak of their "episcope" or "epideascope". A *diascope* is a projector in which the light shines through transparent film. The *episcope* is the complementary projector in which an image of an opaque object (photograph or picture card) is projected on to a screen. The word epi (upon or at) combined with *scope* means a machine for "looking upon" Hence the word *epi-dia-scope* simply refers to a machine that will (1) project opaque material and (2) transparent filmstrips or slides. The British-made dual-purpose *epidiascope* is matched by the American-made "Spencer Combination Delineascope Model VA" that handles microslides, filmstrips, slides and opaque material. While our school in Moradabad has a dual-purpose opaque projector it is a debatable point as to whether this combination of two projectors is better or not. An opaque projector and a standard 35 mm. filmstrip projector can be purchased for the price of the combination projector. Often both the opaque projector and filmstrip projector are needed at the same time in two different rooms for different classes.

Although there are several opaque projectors on the market their construction is much the same. The material to be projected is placed on a platform which is brilliantly illuminated by means of a bulb and a reflecting mirror. The light strikes the opaque object and the image of the object is reflected in a mirror. The mirror is

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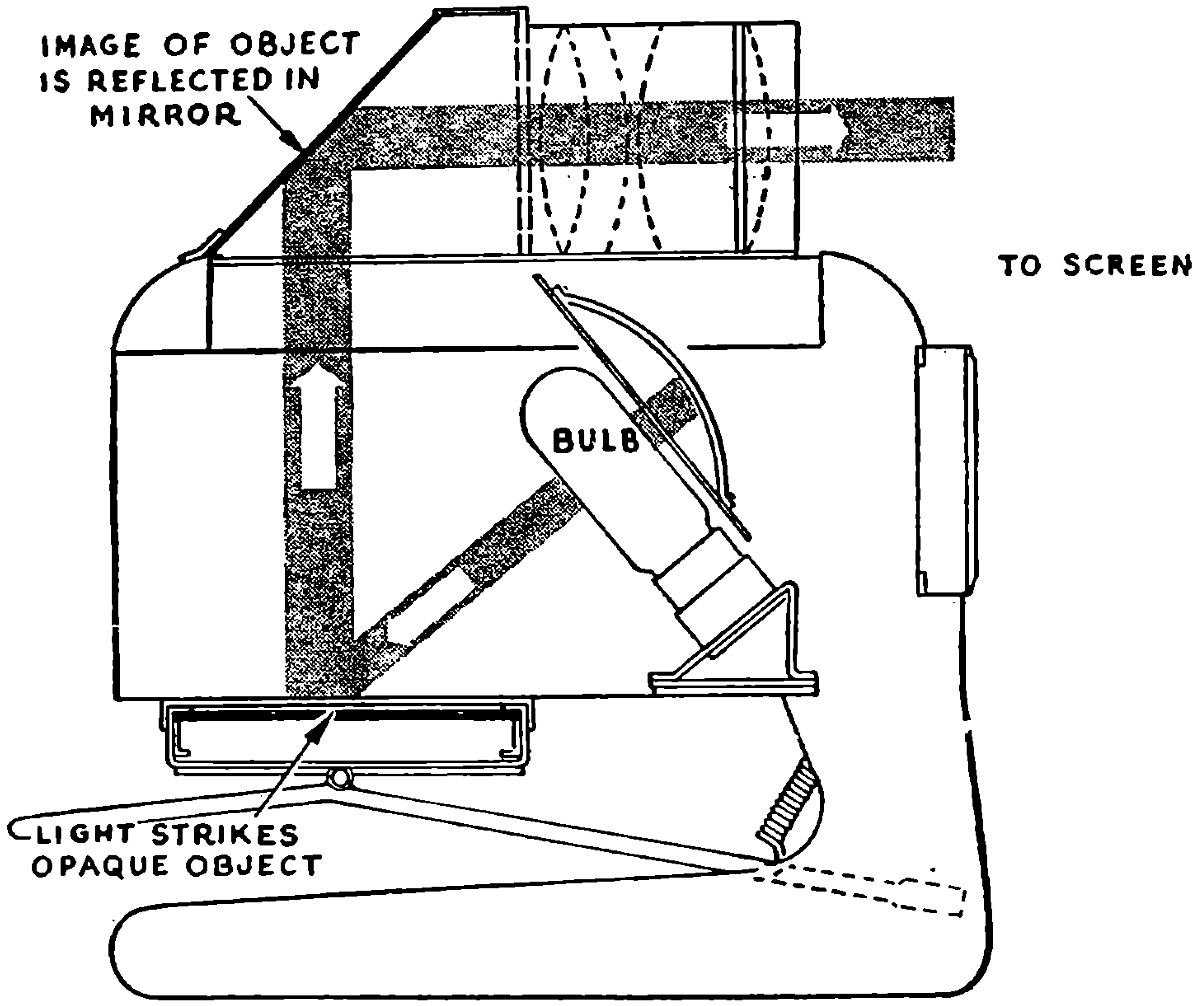
[1] Miss Iris Vimla Rajkumari Wilson is Headmistress, Mission Girls' School, Moradabad, U.P., where the use of Audio-Visual Aids is a model for All-India.

above the platform at an angle of 45° and in front of it is the projection lens by which the picture is projected on the screen.



BASIC STRUCTURE OF OPAQUE PROJECTOR

What materials can be used in an opaque projector?

1. Black and white or coloured flat pictures cut from magazines, books, newspapers or pamphlets
2. Maps, charts and graphs
3. Any typewritten or hand-drawn material
4. Pages of music
5. Page in a book or magazine
6. Fossils
7. Mineral specimens
8. Botanical specimens
9. Working of a watch
10. Coins
11. Stamps
12. Cloth samples
13. Colour harmony material

The wide range of materials that can be used in an opaque projector is readily seen. The picture or other material must be within a 6″ x 10″ size. Only the limits of interest, imagination and creative ability of the teacher and pupils will present the opaque projector from becoming one of the most useful visual tools in Sunday School and school. Because of its bulk it is not useful in district work.

The opaque projector should be located in a church, school or institution (such as hospital) and not transported from village to village as can be done with a simple, less bulky 35 mm. filmstrip projector. I would say that in buying equipment the order would be: (1) filmstrip projector; (2) Public Address system; (3) Opaque projector and (4) then a 16 mm. sound projector.

The opaque projector can be used in many ways in the Church Sunday School, Youth Fellowship meetings, Missionary Society meetings, or any other of the church but it will be especially valuable in the school department.

1. The teacher can review the previous lesson or introduce a new lesson by projecting the picture connected with the lesson.

2. In Sunday School the Bible story picture can be projected and an opportunity given to the children to tell the story in their own words.

3. New songs or poems can be taught to the children by projecting the words on the screen.

4. Worship experiences can be cultivated by using a projected picture in harmony with the familiar hymns and songs children like to sing.

5. The life and work of Jesus can be visualized by using the many pictures available.

6. In Youth Fellowship meetings the growing experiences of boys and girls can be related to Christian concepts by visualizing such themes as "We Grow Up", "Ways We Worship", "Children We Would Like To Know", "Your Life Partner", "Christian Home Patterns", etc.

Among the many advantages of the opaque projector in the Church and School are the following:

1. The Projector is relatively inexpensive.
2. There is an unlimited supply of material.
3. Inexpensive material can be used.
4. Material can be stored easily in notebooks or portfolios.
5. Material can be kept up to date simply by replacing a single picture when a more modern one is available.
6. The best available pictures can be used and later replaced with a better one when it is found.
7. Any hand-made material such as picture, map or chart can be projected.
8. Any hand-written or printed material can be used.
9. The true colours of the original can be reproduced on the screen.
10. When only one or a small copy of a piece of material is available, it can be brought before a large group by opaque projection in which a large screen image is possible.

11. The machine is quiet in operation and time can be allowed for class discussion.
12. Geographical and Historical word study of names and places is possible.
13. By using various colours of paper for background mountings of flat pictures the teacher can take advantage of the psychological effects obtained from the use of harmonious colours.

The teachers' personality is a greater factor with the opaque projector than with other instruments. She must have a thorough knowledge of the material projected. The imaginative teacher will find the opaque projector an excellent outlet for creative work.

Let us look at some illustrations of opaque projection.

Fig. 1. A Fold Picture Strip is a series of mounted pictures on a folded strip of paper $6\frac{1}{2}''$ wide made from heavy art paper. It can be drawn easily through the picture-strip holder. These folded strips are easily catalogued and filed for future use. All of the pictures must conform to a $6'' \times 6''$ size unless a larger model with an opening of $10'' \times 6''$ is available.

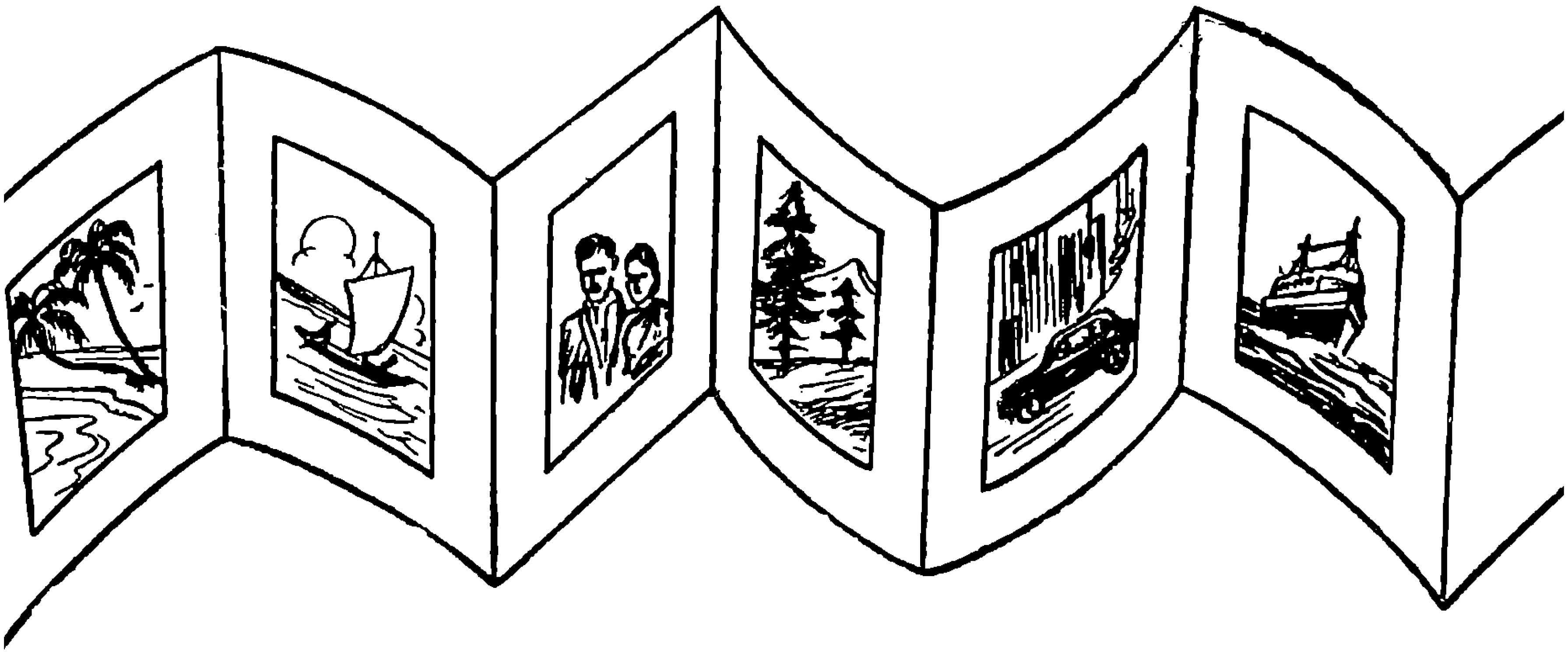


Fig. 1

Fig. 2. A Picture Strip Roll is a roll of paper $6\frac{1}{2}''$ wide for threading through the picture strip holder. A continuous story can be presented in filmstrip fashion. The paper roll can be made from heavy wrapping paper or strips glued together. The rollers are made from tin cans and are turned by cranks. The picture Strip Roll is started from a full roll on one side and is run through the opaque projector platform and fastened with tape to the empty can on the opposite side of the projector. As the crank on the empty can is turned, the paper strip is pulled through the projector and rolled upon it. Picture Story Rolls are stored much like filmstrips.

Fig. 2

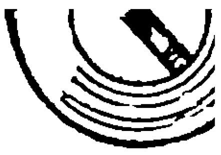


Fig. 3. Picture Strip Holder for Opaque Projector. This is a useful accessory for use of strips of pictures. The dimensions for the 6½″ wide strip is given in Figure 3. It is made of heavy cardboard glued together in the position shown. The holder is placid on the

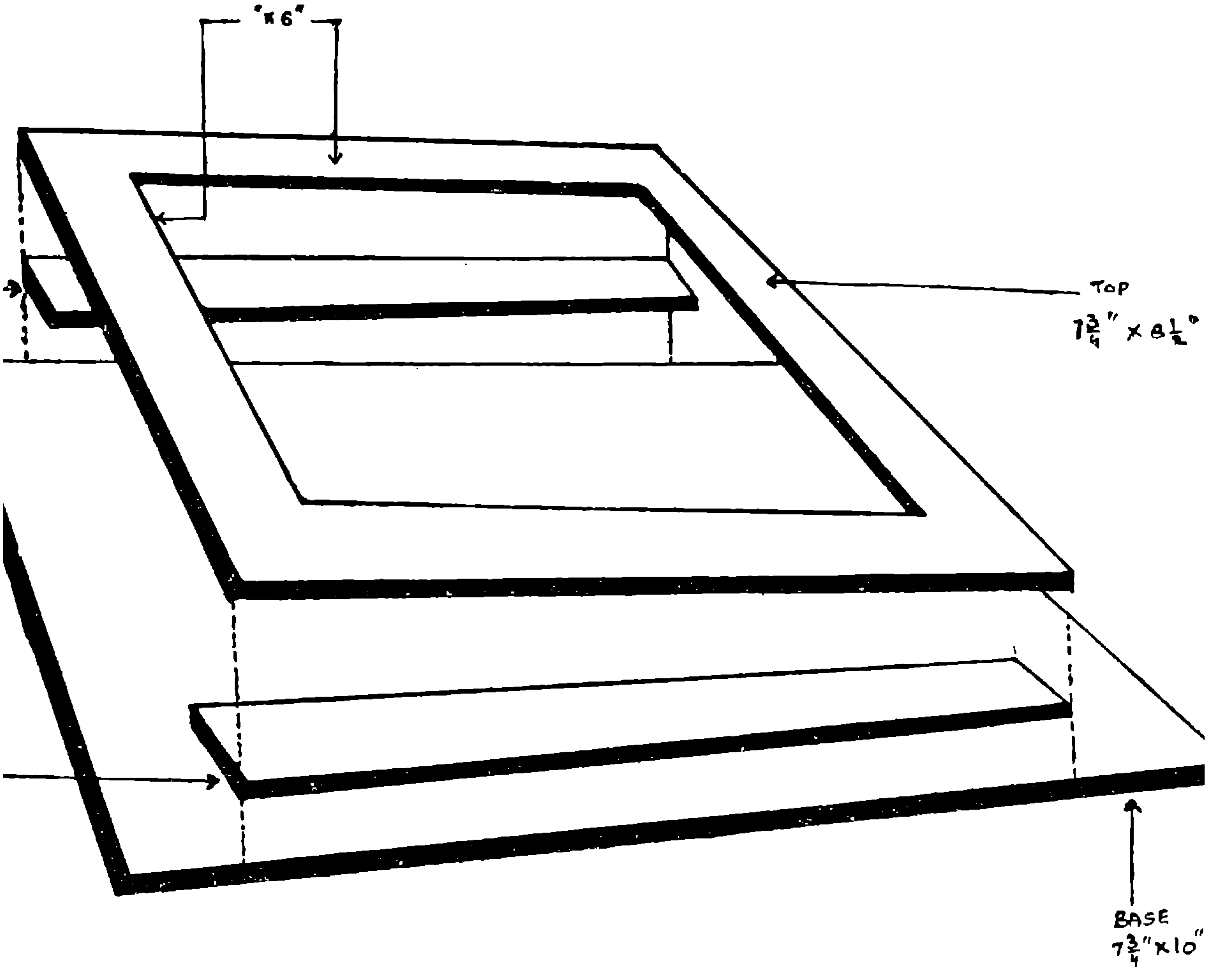


Fig. 3

platen (platform) under the opening in the bottom of the projector and the picture strip is pulled through the holder. The advantage of this holder is that the air from the cooling fan does not flutter

the picture and the platen does not need to be lowered each time a picture is changed. When the platen is lifted light "escapes" and if it does not dazzle the class does distract.

Fig. 4. This is a way to mount pictures printed on both sides of a page. An 11″ by 17″ sheet is folded to 8½″ x 11″ size and holes are cut in the right position for the desired pictures. The picture page is then pasted between the folded 8½″ x 11″ makes exposing the desired picture size.

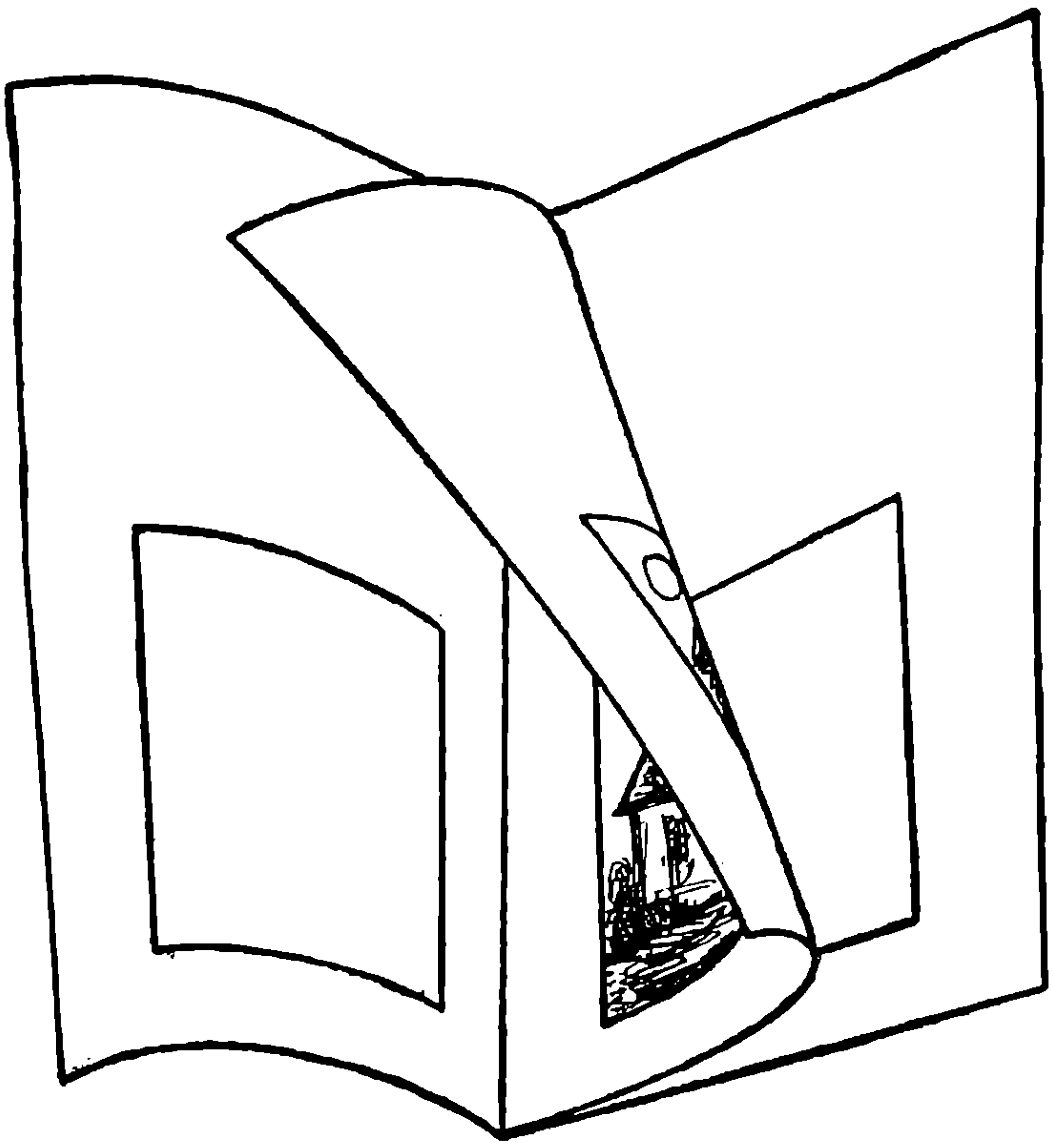


Fig. 4

We are fortunate in having an opaque projector in Moradabad which we use in our school, Sunday School and other Church activities. In week-day classes it is used to review lessons or to introduce a new lesson or unit to the class.

The teacher selects the pictures necessary for her lesson and arranges them in order before the class begins. When the children are seated she begins showing them one by one giving the necessary comments or answers questions the boys or girls ask. We find it a very successful method of reviewing past lessons.

The Opaque Projector is also used in the Women's Society for Christian Service meetings especially when there is a lesson which needs to be illustrated. The leader of the monthly meeting selects and mounts the pictures collects other material and brings everything ready to the meeting.

We frequently use an opaque projector for socials especially for a sing-song service. We have mounted many songs on Folded Picture Strips. When the songs are projected the group sings much better.

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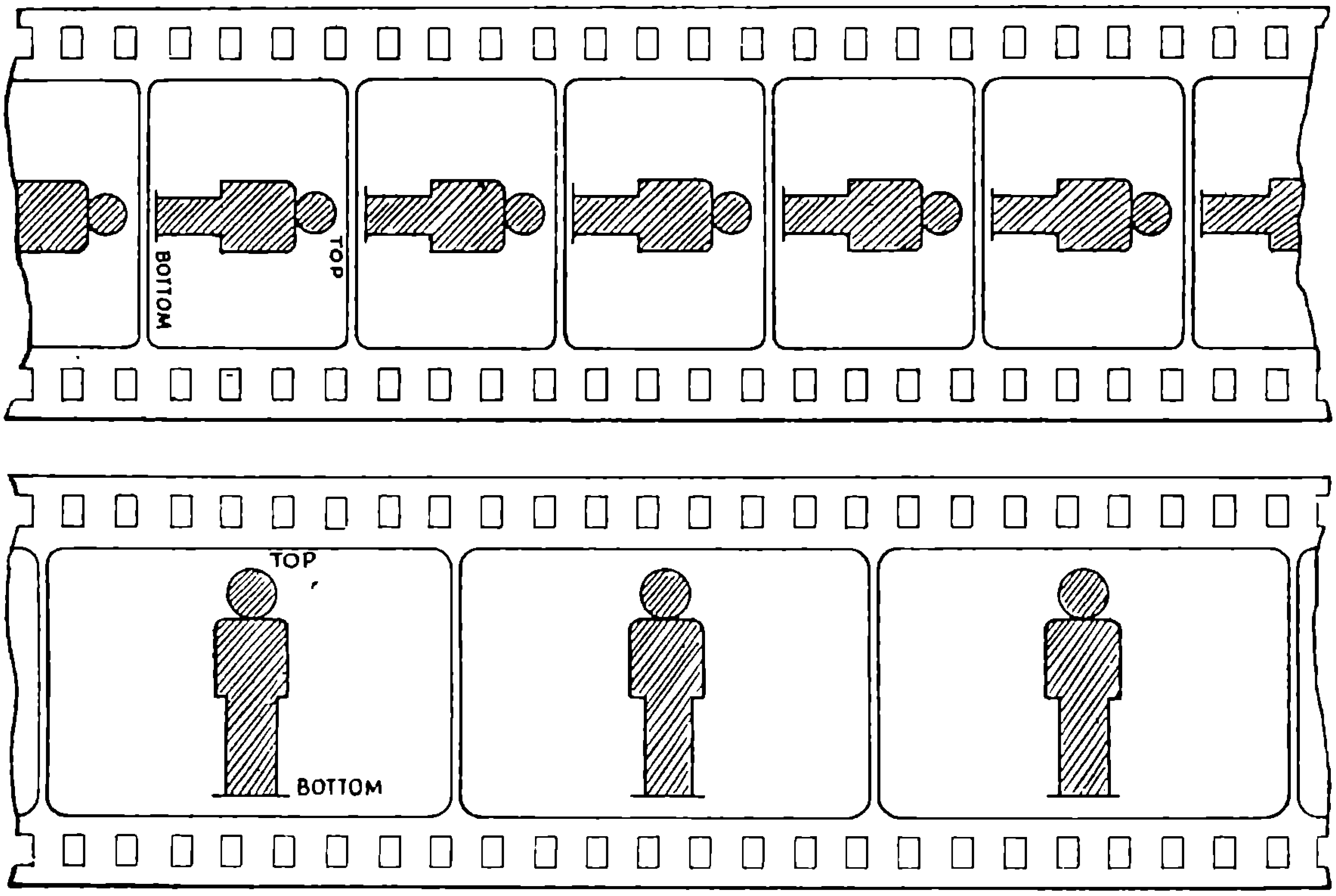
"Filing Opaque Projector Materials," by Harold F. Barnhardt, *See and Hear,* November 1948. Good suggestions are given for mounting and filing material.

Chapter 24

THE 35 MM. FAMILY

D. J. SAUNDERS[1]

YES, it is a family and the members should always be treated as close relatives. Within the family there are the filmstrip brothers —Single frame and Double frame and their sister 2″ x 2″ slide. Sound filmstrip is also a relative, but most of his time is spent in the



SIZES AND ORIENTATION OF SINGLE-FRAME AND DOUBLE-FRAME FILMSTRIP PICTURES

West. He is not a very flexible sort of chap and does not fit into the Indian situation so well. The filmstrip brothers and their sister, however, have made themselves very much at home in the churches

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and schools of India and are helping a great deal with evangelistic and teaching programmes.

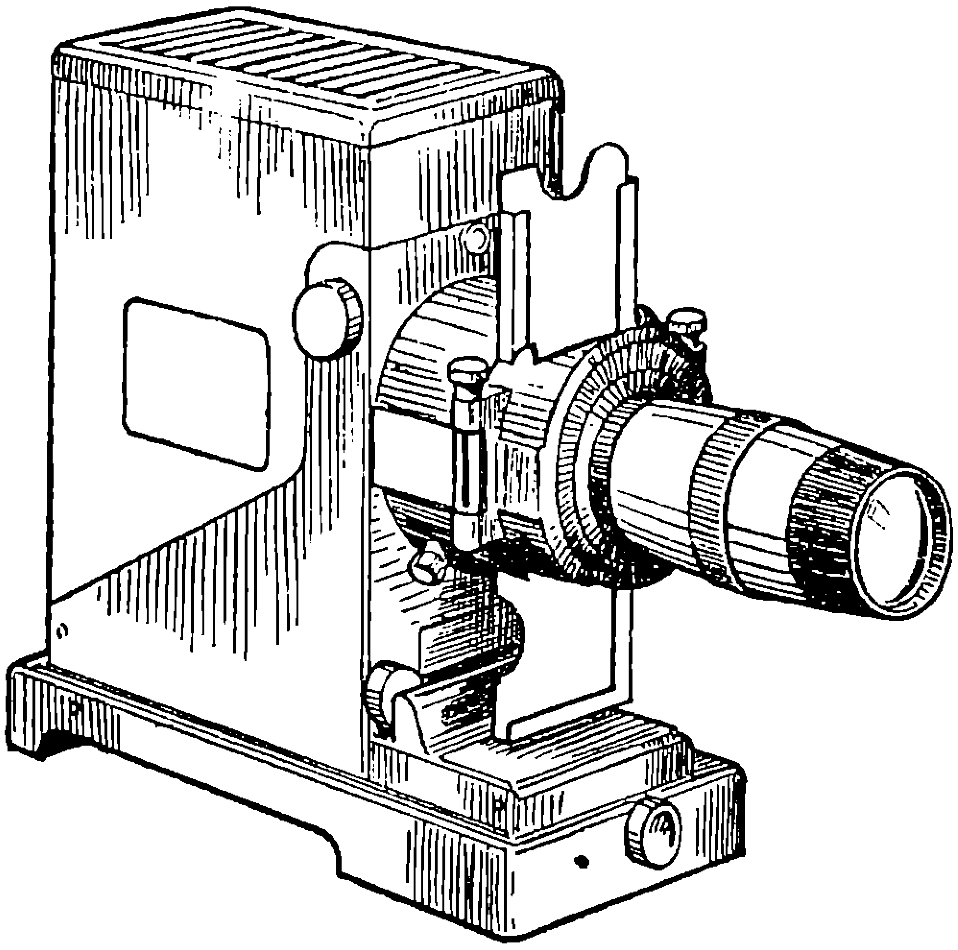
THE FAMILY INTRODUCED

A filmstrip is a strip of film 35 mm. wide carrying a series of transparent positive pictures called "frames"

1. 'Single frame' size, in which most filmstrips are published, has pictures measuring 18 mm. x 24 mm.

2. "Double frame" size, in which a few commercial and some amateur strips are made, has pictures measuring 24 mm. x 36 mm.

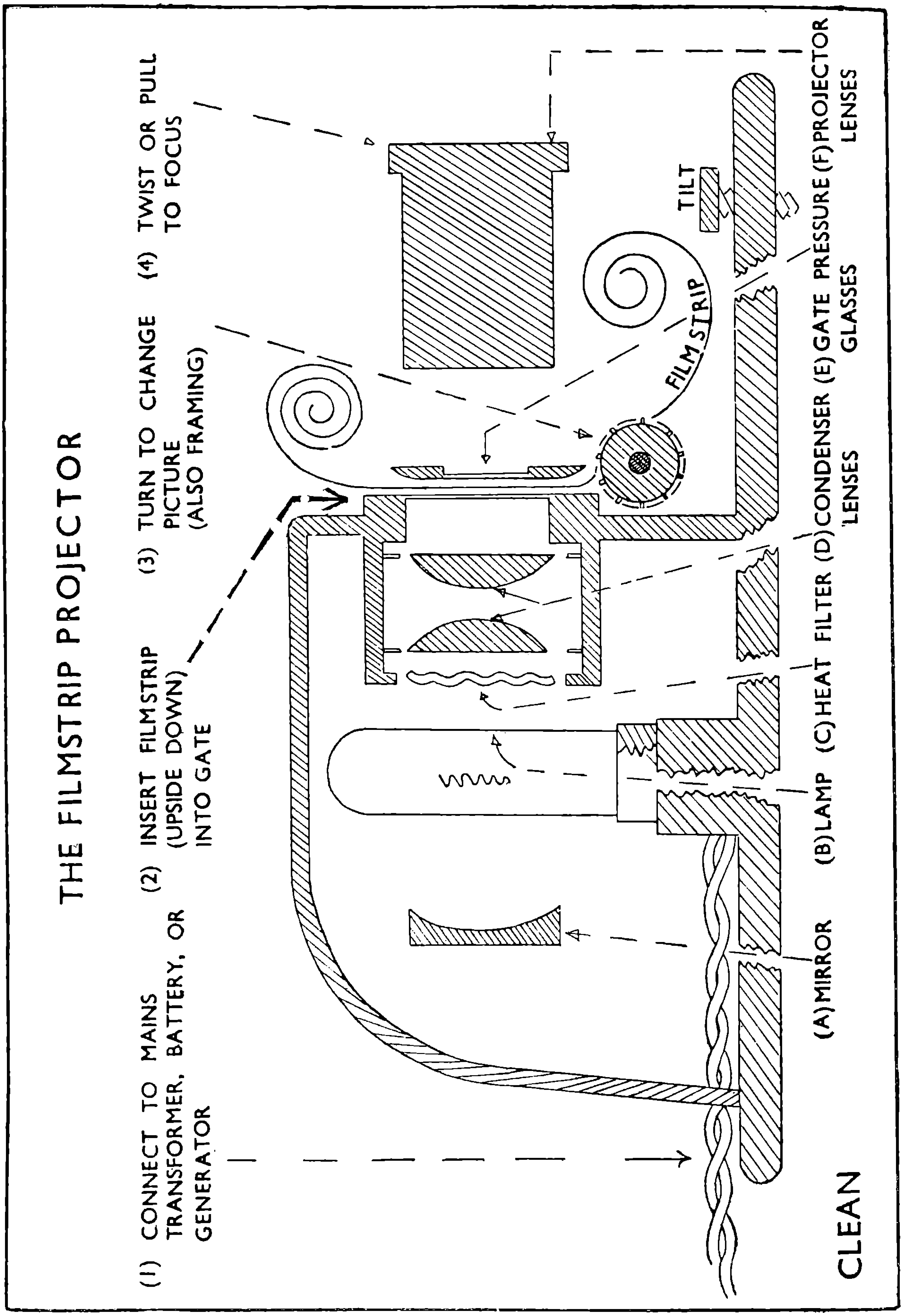
3. 2″ x 2″ slides can also be projected with most modern filmstrip projectors and, although these transparencies which are usually double frame size are all mounted separately in slide binders, the general methods and techniques for using them are similar to filmstrips.



Both single and double frame strips can be cut up and mounted separately in slide binders. This is worth doing when sprocket holes have been badly damaged or when scratches on the pictures are in danger of spoiling the strip. By following this procedure the resulting collection of slides can be arranged easily to suit the purposes of the speaker, but there is a danger of loss, breakage and of pictures appearing out of order or upside down on the screen!

Double frame pictures (whether filmstrip or slides) make the best use of the low powered light source in a kerosene projector, but few filmstrips of this type are produced commercially.

The sound filmstrip has its commentary recorded on a disc or tape which is played as the pictures are projected. The sound


THE FILMSTRIP PROJECTOR
(1) CONNECT TO MAINS TRANSFORMER, BATTERY, OR GENERATOR
(2) INSERT FILMSTRIP (UPSIDE DOWN) INTO GATE
(3) TURN TO CHANGE PICTURE (ALSO FRAMING)
(4) TWIST OR PULL TO FOCUS
TILT
FILM STRIP
(A) MIRROR
(B) LAMP
(C) HEAT FILTER
(D) CONDENSER LENSES
(E) GATE PRESSURE GLASSES
(F) PROJECTOR LENSES
CLEAN

filmstrip has some advantages for educated audiences when the voices of well-known personalities are used and they may have some contribution to make when no one is available who can speak the language of the people to whom the pictures are to be shown. Generally speaking, however, the personal impact of the live voice is more effective in India.

Of the mechanical teaching aids the ordinary filmstrip (or slides) is the most simple, flexible, portable, available and cheap.

THE FAMILY PROJECTED

All projectors, whether for slides, filmstrips or cine film, depend upon common optical principles. Essentially the optical system

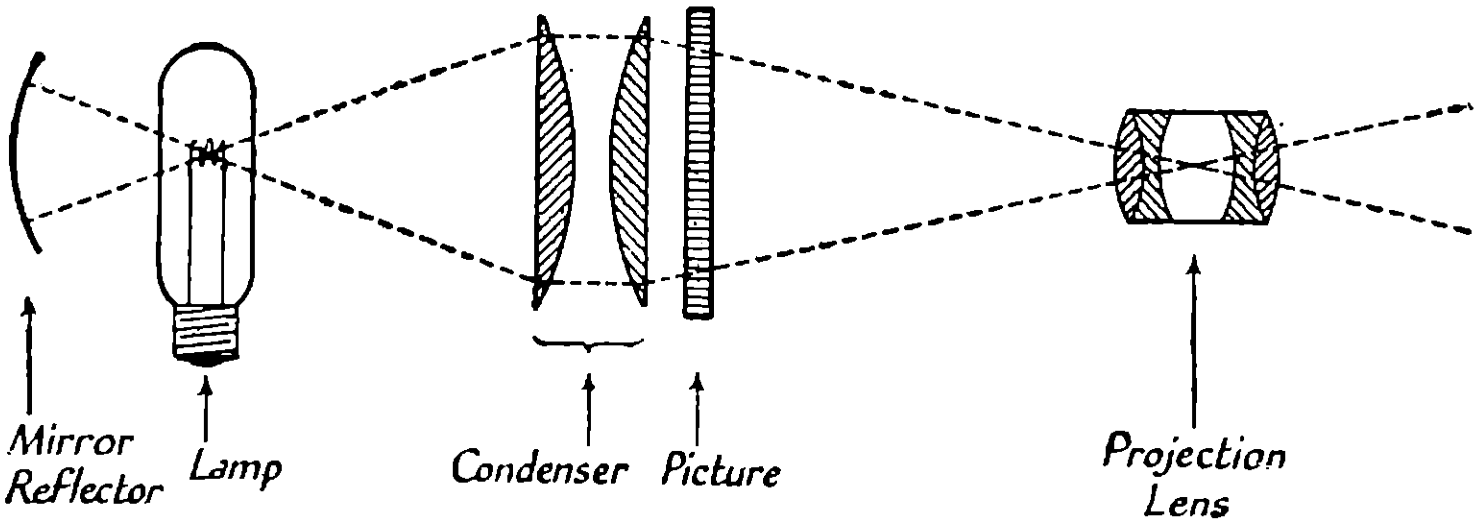


FIG. 1. THE ESSENTIAL PARTS OF A PROJECTOR

consists of a means of illuminating the picture (slide, strip or film) and a means of projecting an image of it on the screen. Figure 1 shows the essential parts of any projector.

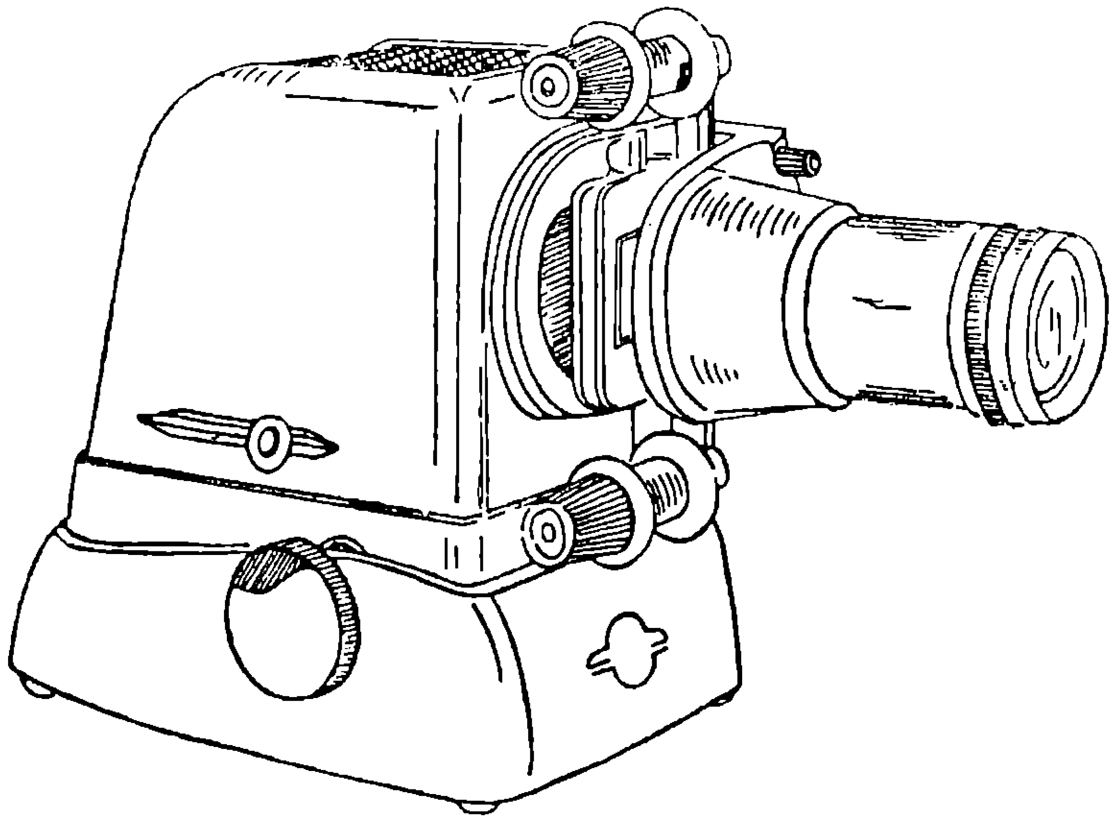


FIG. 2. ELECTRIC PROJECTOR

The filmstrip projector is basically the same as the old "magic lantern". A source of light passes through condenser lenses, is concentrated on a transparent picture, is focussed by another lens and projected on to a white screen so that the picture can be seen by a

large number of people. Most projectors have interchangeable carriers for filmstrips and slides. (Fig. 2)

An electric bulb provides the light source in many projectors. Different voltage bulbs are obtainable and projectors without an electric fan to provide forced ventilation can be used on AC or DC mains current. Six and twelve volt bulbs are also obtainable and this enables the projector to be used out in the villages with a car battery or a low-powered dynamo.

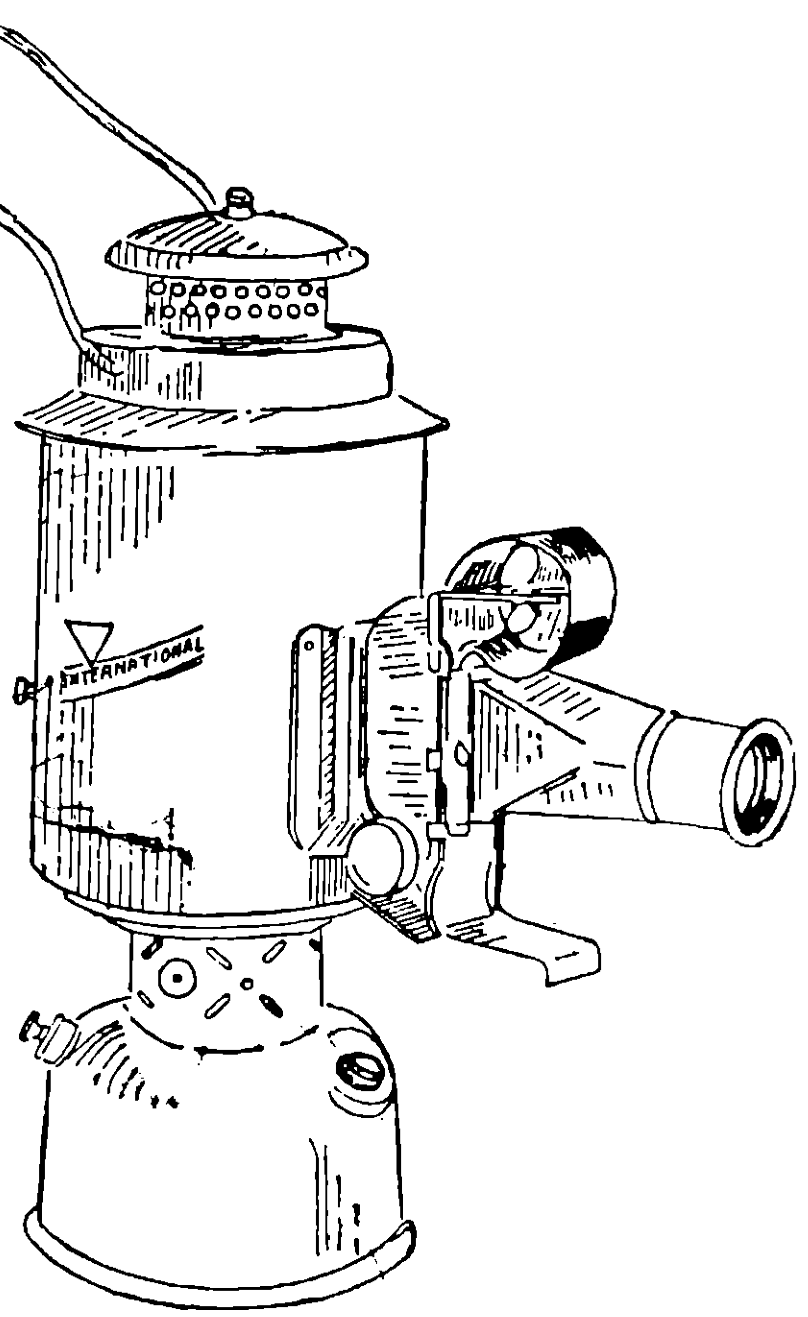


FIG. 3. KEROSENE PROJECTOR

The kerosene pressure lamp is used as light source in the SVE "International", "Keroscope", "Ditmar" and a few other projectors. The SVE International is constructed as one unit, but the Kerosene and Ditmar have separate lamps which can be used for other purposes. (Fig. 3)

A 500 c.p. lamp is said to have about the same power as a 36 watt car bulb and some filmstrip users prefer the 6 volt car battery with a 50 or 75 watt projector bulb. For preaching to a big crowd there is no doubt that the electric projector is more effective, but for the intimate teaching work which needs to be done with small groups within the church the kerosene projector has many advantages.

Many believe that the filmstrip projector provides the greatest educational return for the money spent of any mechanical teaching aid.

TYPES OF FILMSTRIPS

Jet Men. Health pictures using jet men (pin men or stick figures) on flash cards have been used with success in the villages and these are now available in filmstrip form. They have the advantage of extreme simplicity and peculiar costumes do not restrict their use to any one part of the country. There are no confusing backgrounds, but just the bare essentials for telling the story and making the necessary points.

Art Work. There are many filmstrips available made from black and white drawings and coloured paintings. The standard of these filmstrips varies considerably, but there are great possibilities in the technique. Without using jet men, simplicity can still be the key-note whether the filmstrip is produced in black and white or colour. With art work there is far more control over subject and emphasis than with photos. The main feature of each frame can be stressed by composition and colour and this is very valuable. Among the series available the following are worth consideration:

Concordia, Concordia Publishing House, 3558 So. Jefferson Street, St. Louis 18, Missouri, U.S.A.

Projected Bible, Visual Education Ltd., Upper Berkeley Street, London, W.1, England.

Bible Books for Small People, coloured strips from SVE, 1345, Diversey Parkway, Chicago, 14, U.S.A.

Black and white strips from VIS, 168a Battersea Bridge Road, London, S.W.11, England.

Aurel Ltd., 167, Collins Street, Melbourne, Australia.

Film Photographs. The pictures for some filmstrips are taken straight from the 35 mm. film of the same story. Others are taken from stills shot at the time of the film production. Whichever method is followed the result is not ideal from a filmstrip point of view. If produced separately, the filmstrip would not always follow the same pattern as the film and points would be emphasised in a different way because of the still medium being used. On the other hand, however, the filmstrip which is related to a *silent* film has usually good continuity and this is very valuable for filmstrips. Filmstrips taken from films are also of great value when used by a competent leader in an integrated programme with the film and strip on the same theme or story. Many series are available. See the following:

Religious Films Ltd., 6, Eaton Gate, London, S.W. 1, England.

Cathedral Films Inc., 1970, N. Caherenga Building, Hollywood, 28, Calif., U.S.A.

Good Samaritan, Prodigal Son and The Transformed Life produced by Ferger and McEldowney at Leonard Theological College, Jabalpur, M.P. From Allahabad or Punganur.

Filmstrip Photographs. Some filmstrips are made from photographs taken for that one specific purpose. In the course of the next few years it is hoped that many more Christian strips will be produced in India by this method. The following are at present available from Allahabad and Punganur:

The series on The Christian Home by Ferger and Blaylock.

Marriage Young Parenthood The Family

Kottayam 1952,
Rupees, annas and pies.
Peace with your brother.

} by Korteling and Saunders.

Collected pictures. This type of strip is very common, but frequently it lacks visual continuity and therefore has less value for the villager. Many Bible geography strips in this group lack human interest and villagers cannot be expected to give sustained attention to general scenes of Bethlehem, Jerusalem, etc. Even when people and occupations are shown this type fits the class room better than the village. See: Picture Post New Testament Series, Picture Post, 43, Shoe Lane, London, E.C.4, England.

The series. The Spread of Christianity prepared by Dr. John Foster and produced by Common Ground Ltd. (Distributed by National Educational and Instructional Films Ltd., National House, Apollo Bunder, Bombay.)

Life of Christ. Sometimes the pictures collected are scenes from the life of Christ painted by different artists and our Lord appears with different features, clothes and companions. When speaking to simple people the difficulty here is obvious. Among the many filmstrips on the life of Christ the following have scripts showing one way of using a biography strip without telling the details of every story illustrated. Life of Christ, 2 parts, by Barosin, from Evangelical and Reformed Church, 1505, Race Street, Philadelphia, Pa., U.S.A. Life of Christ by Copping, from SVE., 1345, Diversey Parkway, Chicago, 14, U.S.A.

There are many types of filmstrips and the right kind for *your* situation will not necessarily be found by reading publishers' catalogues or N.C.C. library lists! Aim, theme, story, action, nature of first and last pictures, backgrounds, symbols, colour, lighting, drawings, photos, portrayal of Christ, extra Biblical characters, captions, close-ups, visual continuity, etc., etc., all have a bearing on the question! The following ten points are suggested for village filmstrips. This list will need adapting to other situations. The town dweller has a wider experience and therefore the choice of pictures can be more varied. The straightforward narrative which is so valuable with villagers can be changed for different continuity techniques. Even the needs of villagers in some parts of India may require something different.

TEN COMMANDMENTS FOR VILLAGE FILMSTRIPS

1. Thou shalt have one aim and theme—obvious in the pictures or made obvious by the commentary and related to the life of the Indian villager.
2. Thy first picture shall be something familiar to village people. It is not necessary to start with credit titles and frame number one. Start with a good establishing shot relating to the home, family or work.
3. Thou shalt have clear pictures of human action—every picture must tell a story, the backgrounds should be unobtrusive and there should not be too many figures.

4. Thy pictures shall tell the story—when pre-viewing with subtitles or commentary the pictures should carry the story. The first thing to strike the audience on seeing each picture should be the idea necessary to carry the story forward.
5. Thou shalt not have unfamiliar backgrounds—skyscrapers, ocean liners and Western suburban homes are too unfamiliar to be used in ordinary Christian teaching. If the main focus of attention in the foreground is something which people recognise easily a few strange details in the background and not so important.
6. Thou shalt have natural pictures—the closer the pictures approach to the natural the more easily are they understood.
7. Thou shalt have colour if possible—but beware of obscure outlines and confused colours.
8. Thou shalt reveal thy message by close-ups—the close-up is invaluable for climaxes, summaries and appeals. The close-up usually moves people emotionally.
9. Thou shalt make a definite appeal—the strip itself should have a definite appeal service the main aim of the story. It should not be necessary to have a ten-minute pep talk appeal at the end.
10. Thou shalt have some guide of words for thy user.

CHOOSING AND USING FILMSTRIPS

N.C.C. Film Libraries stock hundreds of filmstrips and they can be borrowed for a few annas each. Postages and a small service charge are the only expenses. After a careful study of the catalogues a few strips can be ordered for inspection and experiment.

A quick pre-view of the filmstrip will give a general idea of its suitability, but a closely watched experiment with a small audience will reveal what people really think about the strip and what benefit they get from it. As a result of *your* experiments, make a list of standards which filmstrips require in order to satisfy the needs of your district, and, as each new strip is seen, apply these standards.

Sometimes Christian preachers on tour wish to use particular filmstrips for a period of several months. In schools, teachers will often want to fit a filmstrip into the middle of a lesson course and it is essential to have the strip available at the right time. At Easter and Christmas the demand for filmstrips is very great and it is not easy to get one's preference from the libraries without ordering months in advance. For these reasons it is valuable for a district, group of churches or schools to buy strips and organise their own filmstrip library. A small library of strips selected to suit the needs of the local situation can be invaluable and steps should be taken to start buying the right material now.

Having bought filmstrips. make sure that all who have projectors in your area know what is available. Explore the possibilities of using the strips in different situations. Publicise the successful experiments of others so that people may make full and imaginative use of what is available. A good filmstrip programme takes several hours to prepare and when this careful work has been done by a leader or preacher, make sure that he has the opportunity to use his experience in as many villages as possible.

PREPARING AND PRESENTING FILMSTRIP PROGRAMMES

Preaching to a crowd of non-Christians at a jatra or in a bazaar is very different from teaching a group of Christians in church or school. The filmstrip can do both jobs very well indeed, but it is necessary to be clear about the differences involved before going ahead. The filmstrip, the programme and the technique will vary according to the situation. The projector itself is also a variable factor. As explained earlier, the kerosene projector is not ideal for preaching to crowds. Bearing in mind the work to be done consider the following suggestions:

TEN COMMANDMENTS FOR PREPARING A FILMSTRIP PROGRAMME

"The value of a filmstrip programme is in direct proportion to the amount of careful thought and preparation which is done beforehand."

1. Thou shalt work as a team and prepare by group study.
   —the team also helps with the presentation of the programme, listens for audience reactions and assists with personal follow-up work.

   Thou shalt pre-view and analyse the contents of the strip to be use.
   —analyse into sections (whether "narrative" or "collection of pictures' type). Analyse the key points in individual pictures.

   Thou shalt decide on one limited aim for your programme.
   —the aim to be related to the pictures to be shown and also to the long-range policy of the Church.

4. Thou shalt cut out all extraneous matter.
   —unsuitable pictures, sub-titles, etc.
5. Thou shalt prepare carefully the summaries, application and appeal.
   —Everything should be designed to further the main aim.
6. Thou shalt prepare a detailed programme.
   —lyrics, readings, items, etc., varied but all serving the main aim.

7. Thou shalt prepare an introduction which links with the experience of the people.
   —help to create a point of view so that they react favourably to the programme.
8. Thou shalt consider the possibility of using more than one visual aid.
   —a visual unit on the subject may be presented over several days or weeks.
9. Thou shalt advertise your programme correctly.
   —prepare the minds of the audience by the right type of announcement which will guide in the desired direction and not just to tamasha.
10. Thou shalt make sure that the speaker takes his responsibilities seriously.
   —he must be prepared to adapt himself to the filmstrip teaching technique.

A SIMPLE PROGRAMME

For a short filmstrip the following type of programme has been found effective for an audience composed mainly of village Christians. There are many possible variations.

Introductory lyrics.
Introduction to relate strip to experience of the people.
First showing of filmstrip with straightforward story commentary.
Theme lyric taught.
Second showing of filmstrip with questions and application.
Short Bible Reading and relevant text taught.
All sing theme lyric.
Short prayer.

But even a simple programme needs careful presentation. Consider the following:

TEN COMMANDMENTS FOR PRESENTING A FILMSTRIP PROGRAMME

(The first five commandments deal with the mechanical aspect and two sub-sections are included which refer to kerosene projectors. The second five commandments are concerned with the contents of the programme to be presented.)

1. Thou shalt discover a suitable site.
   —consider the space available, direction of the slope, overhanging trees, position of the moon, etc.
2. Thou shalt place the screen about 5 feet from the ground when projecting to a large audience.
   —a flat matt surface enables a wide viewing angle.
3. Thou shalt arrange for the projector to be above head level.
   —the best seats are in the centre so avoid a gangway.

4. Thou shalt have the generator out of earshot.
—behind a wall, in a courtyard or 100 yards away.

4. *a*. Thou shalt not try to cope with big crowds when using a kerosene projector.
—about 150 people is about the maximum.

5. Thou shalt arrange the P.A. system so that loudspeakers are near the screen and microphone near the projector.
—loudspeakers at the screen help audience concentrate. Microphone near projector helps co-ordination in presentation.

5. *a*. Thou shalt marshall the people together near the screen when using a kerosene projector.
—the speaker can stand to one side half-way between screen and projector. He thus has all people in front of him and can also see the screen and signal to projectionist.

6. Thou shalt have no breaks or hitches in the programme.
—all should be integrated so that the presentation is smooth.

7. Thou shalt give a continuous narrative.
—use active verbs to keep the story alive and moving.

8. Thou shalt not tell people what they can see for themselves.
—but the first sentence spoken with each frame should aim to link on with the main subject of the picture in an active way.

9. Thou shalt watch the last sentence spoken with each frame.
—the speaker's job is to conduct a campaign in the minds of the audience and he can do this best if he always anticipates the next picture.

10. Thou shalt let the visuals tell the story.
—The message of the evening should, as far as possible, be linked with visuals which make a definite impact and arouse some sort of emotional response.

THE VISUAL UNIT

With village work, a "flying stunt" visit utilizing filmstrip may have some value, but a programme of two or three meetings can be more effective. On the first occasion the story can be presented in a plain straightforward way with the use of flannelgraph. After the story and a few questions to the audience on the subject and the message a short text summing up the teaching is taught to everyone. Finally, the theme lyric, which has been chosen to fit the main aim of the campaign, is sung and a deliberate effort made to teach a few verses. On another occasion the filmstrip team follows with the same theme and the story is presented in a different way. More time

is devoted to the spiritual side of the story and to the personal application of the message. Afterwards the audience is asked to recall the text taught on the previous occasion and then another relevant one is learned. The theme lyric and prayer close the meeting. The following week the local teacher can revise the subject by the use of related posters. As before, the texts are revised and the theme lyric is sung.

The filmstrip is ideally suited for helping with a regular village teaching programme in which other aids are used. In many areas handbooks of Bible lessons are used as a basis for regular instruction and suitable filmstrips can be found to illustrate many of the stories. When the aim is to teach one lesson a month the local teacher or preacher can use the blackboard, flat picture, flannelgraph, etc., during the weeks before and a regular visit with a filmstrip can gather up the work of the month and help to crystallise the lessons in people's minds. For teaching with all visual aids a certain amount of training is required, but it is comparatively easy for local teachers and helpers to take over the flannelgraph, posters and flat picture work. The filmstrip presentation can be left to those who have given time to the subject and their help is used to the full every month.

The filmstrip can also help with regular evangelistic programmes. Although the congregation as a whole will not be responsible for the picture presentation there are many ways in which they can help. The filmstrip presentation should be regarded as part of a wider campaign in which the help of the local congregation is sought at every stage. Bhajana parties, kalekshapams and kolatums can also be included in the scheme. When village teaching is planned in this way it can result in good training for the congregation and a fuller understanding of their responsibilities for evangelism. In fact, the teaching and preaching can be linked so that the teaching supports the preaching and the preaching leads naturally out of the teaching.

Integrated programmes using film and filmstrip on the same subject have great possibilities in evangelistic and health programmes and it is hoped that this technique will be developed in the future.

SCHOOLS AND COLLEGES

To a large extent the suggestions made above relate to the use of narrative strips. There are also many instructional strips which need to be used differently in schools, Sunday schools and colleges. Qualified teachers will find no difficulty in adapting their methods to suit this aid. It is important to integrate the filmstrip into the regular syllabus. The sooner the children realise that a screening is a regular lesson and not a *tamasha*, the sooner the visual education programme will become effective. Some teachers use the words "Preparation, Presentation and Follow-Up" and others speak of "Introduction, Exposition and Activity" The classification is

immaterial, but the stages need to be followed if the filmstrip lesson is to be a success. Pupil participation at all stages undoubtedly assists the learning process.

In many areas there is a library of educational filmstrips at the office of the local Director of Public Instruction. For strips suitable for Sunday School lessons write for suggestions and lists to the I.S.S.U., Coonoor, Nilgiris.

PROJECTION

A well-prepared programme using a suitable filmstrip can be spoiled by bad projection. The audience must be able to see the pictures clearly with a certain degree of comfort. Attention must be given to the practical and mechanical details of projection. Remember that the best projection goes unnoticed, while poor projection is marked by distractions and interruptions, all of which disrupt the audience.

The projector must be in good order. Most of the troubles associated with the care and maintenance of filmstrip equipment are connected with damp and dust. Dampness, especially at monsoon times, is a danger which leads to rust, corrosion and lens fungus. In very humid areas trouble is sometimes experienced with the projector pressure plates and it is wise at these times to keep it in an air-tight box with some sort of drying agent. Dust is also a great enemy of picture brightness and will cause serious damage by scratching the filmstrip.

With the equipment in good order, the question of the site and the placing of various items of equipment have to be considered. This is dealt with in Chapter 28. Here it is only necessary to refer to two methods of projection which are generally associated with filmstrip only.

KEROSENE PROJECTION

The low-powered kerosene projector caters for a crowd of 100-150 people and with this sized group the speaker can have some measure of personal relationship with the people. This is impossible with the purely mechanical aids or when dealing with vast crowds.

Special attention must be given to the quality of the screen especially if single frame strips are to be used. In addition, with a low-powered projector of this sort, it is very necessary to use all the space within reasonable distance of the screen and special efforts should be made to see that people sit close together. It is an advantage to have the speaker identify himself with the picture on the screen by standing as close as possible, but, if this means that he has to turn round and interrupt the flow of his story with every new picture, it is perhaps better to have him standing to one side

and half-way between projector and screen. In this way he has all the audience in front of him and he does not have to turn to see the pictures. Care must be taken in the choice of strips. Densely coloured strips may be very beautiful with a 300 watt bulb behind them, but they are not always successful with a kerosene projector.

DAYLIGHT PROJECTION

As most schools and Sunday schools meet during the hours of daylight, consideration must be given to various methods which are possible under these conditions.

Complete blackout permits a larger and more satisfying picture, but, in a big school, it is not possible to have all classes screened in this way. Many schools arrange for one special projection room, but, when filmstrips are used by several classes, this adds greatly to the difficulties of organisation and the time-table.

Two main methods may be employed in a partially screened classroom.

(*a*) A 300 watt projector when directed to a small screen (2′) can give a clear picture for a class of about 20 if no other light is allowed to fall directly on to the screen. Shading can be achieved by making a hood directly round the screen itself or by having a draft screen between the window and the filmstrip screen. It is sometimes possible to use the open doors of a wall cupboard. If all walls are white or light coloured it is wise to have some sort of draping over every window to prevent reflected light spoiling the picture. There will still be plenty of diffused light in the room for taking notes and conducting the lesson.

(*b*) Alternatively, it is possible to use rear projection. With a translucent screen the eye sees transmitted light and not reflected light. This makes it more independent of classroom lighting conditions, although it is still wise not to have direct light falling on the screen itself. The angle of viewing is small and therefore the class must sit directly in front of the screen. The projectionist must also remember to insert the filmstrip in the projector the other way round, unless a mirror is used between projector and screen. The translucent screen can be made with an old picture frame about 24″ x 18″ After the glass and backing have been removed a sheet of tracing paper or linen should be glued to the frame. Some plastic materials on the market are also very good.

For further information on the subject see the 90-page illustrated "Filmstrip Handbook for India" by Denys J. Saunders. Obtainable from the N.C.C. A-V Field Directors, Allahabad and Punganur.

Chapter 25

MOTION PICTURES

H. R. FERGER[1]

IT should not be necessary in these days to give reasons for the value of motion pictures. However, it is well to understand their weakness as well as their strength. The movie is supreme in reproducing the record of an event or demonstrating complex operations such as bathing a baby, removing a cataract, tying a knot, or throwing the discus. They can also bring the distant past such as the New Testament world into the present. However, one difficulty is that too often the movie travels too fast and a person is unable to take it all in. This is true when we show movies to a village group and use films prepared in the West that contain too many foreign details that divert the attention from the theme. The tempo is also usually entirely too fast. The ideal is to combine still pictures with a movie. For instance, in the *Parable of the Prodigal Son* (taken at Jabalpur by McEldowney and Ferger) one can project the filmstrip first to tell the story, introduce the characters, and then project the motion picture. Almost no running commentary will then be necessary. In the N.C.C. Film Libraries at Punganur and Allahabad we have such filmstrips of several religious films, including those of Arthur Rank, Cathedral Films, Moody Bible Institute films, etc.

WIDTHS OF MOVIE FILM

There are three different gauges or widths of movie film in common use today, 35 mm., 16 mm. and 8 mm. Occasionally another width, 9.5 mm., is met which is used in Pathe projectors. The 35 mm. film is the width almost universally used for commercial theatres. 8 mm. is used by many for amateur work because the film, camera and projector are much cheaper than 16 mm. For pictures

[1] Rev. H. R. Ferger, B.D., M.A., Jumna, Allahabad, has been loaned by the Synodical Board of the North India American Presbyterian Mission and the Presbyterian Board of Foreign Missions in the U.S.A., to be the Field Director for North India of the Audio-Visual Aid Committee of the National Christian Council. He is a pioneer in visual aids, a noted photographer and skilled cinephotographer.

of a purely personal nature, and for an audience of not more than 200 persons 8 mm. film is effective. The number of 8 mm. films for rent or sale is limited. For more serious work, however, the

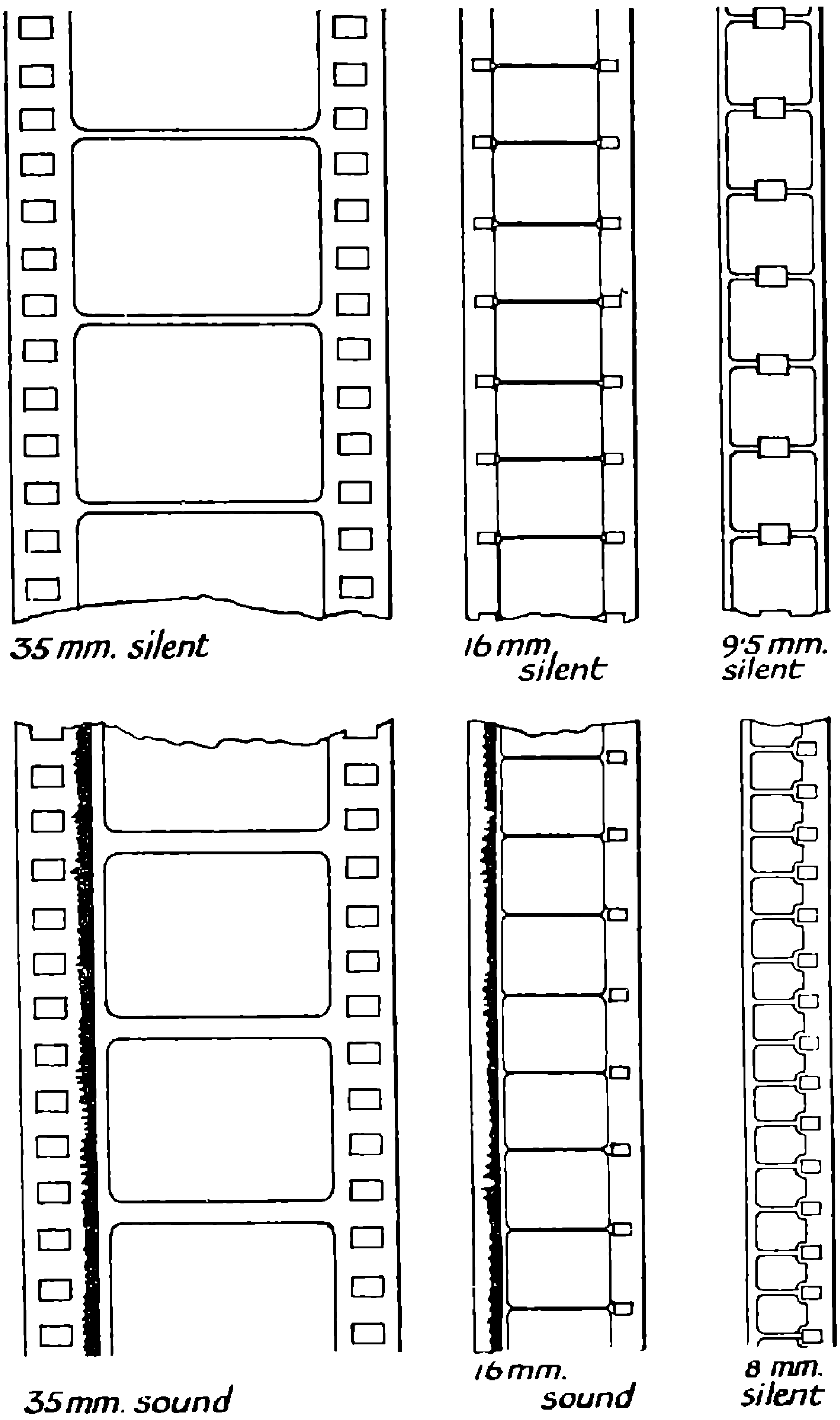


FIG. 1. THE VARIOUS GAUGES AND TYPES OF CINE FILM

16 mm. film is far superior. In fact, due to finer grain emulsions produced the past few years, better lenses in both cameras and projectors and higher power illumination now possible in projectors, 16 mm. film is beginning to displace 35 mm. film in some commercial theatres.

MOTION

It should be remembered that in film-projection, though there is an illusion of motion on the screen, in actual fact one is seeing a rapid succession of still pictures. In other words there is no movement at all taking place on the screen; the movement is only apparent. Motion picture film of any width consists of a series of still pictures printed in sequence on a strip of film. The film is not moved continuously through your projector because this would produce a blur. The amazing fact is that the film is drawn through the projector in a series of jerks called *intermittent movement.* In order to produce these continuous jerks with little noise or pressure on the film a precision instrument is necessary. When the film is stationary in the gate of the projector a shutter is interposed in the light beam so that there is a momentary bit of blackness on the screen while the film is moved ahead. This continues and because of the phenomenon known as *persistence of vision* if pictures are projected at a rate of 16 or more frames per second the individual still picture plus the interval of blackness are not separable and the effect is an illusion of movement.

THE PROJECTOR

While there is much variation between projectors in cover design and positioning of the various knobs they are all very similar in operation. Following the path of the film we find that they all start with a loaded reel and end up on an empty take-up reel (see Fig. 2). The film is drawn forward by a sprocket wheel, passes between the film gate where claws produce the intermittent jerks necessary for satisfactory projection and onward—jerk, jerk—to the empty take-up reel. If "sound" is added to this projector the electronic parts are located between the bottom sprocket and the take-up reel.

In 16 mm. film there are exactly forty frames (pictures) to the foot. At silent speed (16 frames per second) this requires just $2\frac{1}{2}$ seconds to project one foot of film or 17 minutes for the usual reel of 400 feet. At sound speed (24 f.p.s.) it requires 11 minutes to project 400 feet.

SOUND OR SILENT

One is often asked the question whether one should get a sound or silent projector, especially if one wants to show religious films in the villages or in a school where few can understand an English sound track. The answer is decidedly in favour of the sound projector. Almost no silent religious films (or any others for that matter) are now being produced in the West. The Film Division of the Ministry of Information in India is producing only sound films, with sound tracks in some five languages besides English. We have found that many village groups have become very sophisticated due to

urban contacts and travelling cinemas and demand sound films, even if they do not understand the sound track at all. The clinching

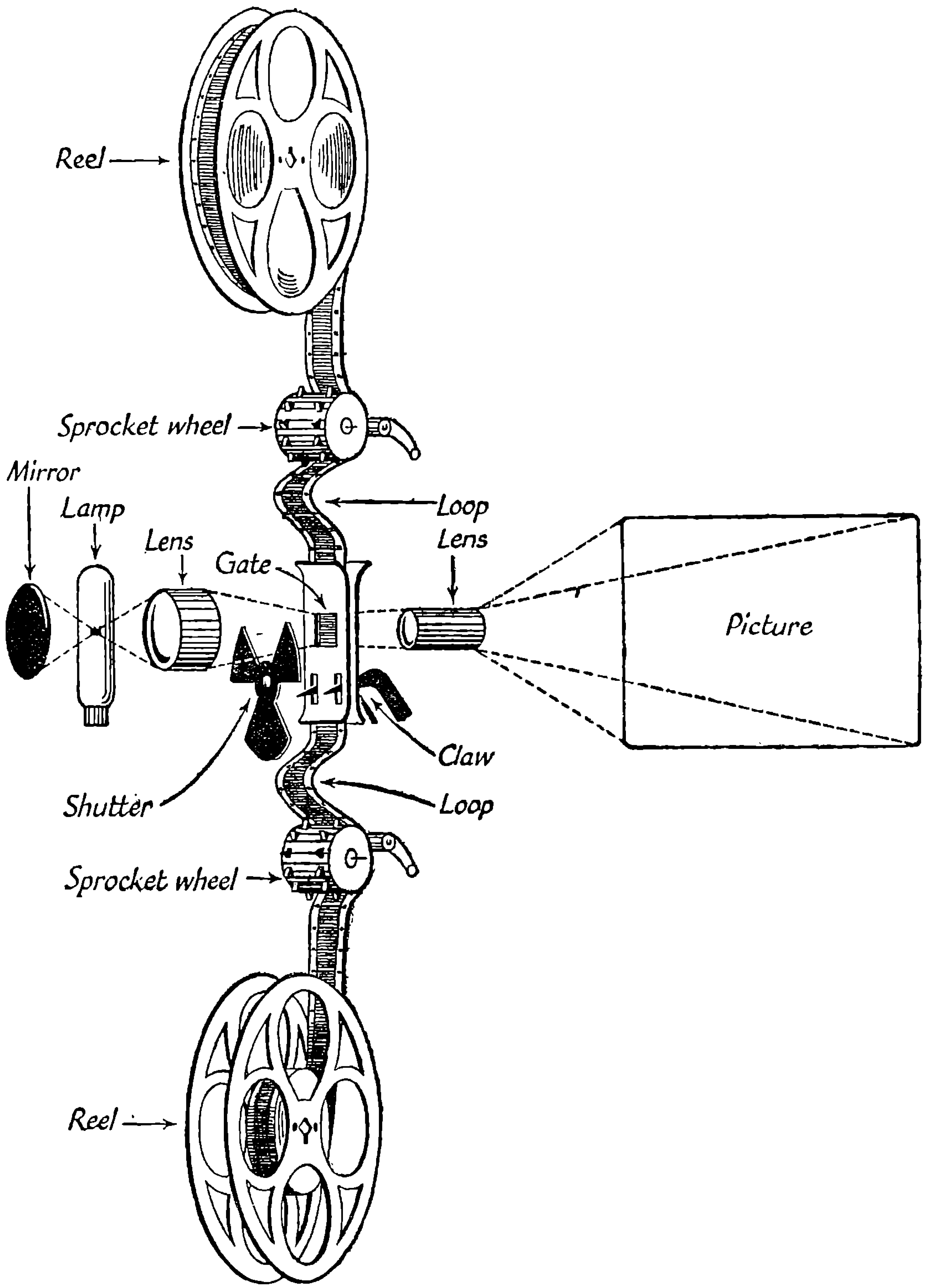


FIG. 2. THE ESSENTIAL PARTS OF A CINE PROJECTOR

argument in favour of a sound projector is the fact that with all makes and models, a microphone can be plugged in so that the amplifier and speaker can be used as a Public Address system to give

a running commentary on the film, or a turntable plugged in for playing records.

It requires some experience to know how to use most effectively a sound film, with English sound track. The film of course should be previewed (as is true of all films) and a brief introduction given about the film, its story, purpose, etc. Some films such as PRIOR CLAIM (Moody) and almost all sports films tell their own story, and very seldom is it necessary to cut off the sound track, especially in the musical parts, to give a brief indication of the meaning of what they see. Much the same is true for a Christian group seeing the King of Kings as there is no spoken narration and they are in general familiar with the story. With a non-Christian group, however, when one uses this same film, one will want to explain and preach almost all the time, excepting the lightning and earthquake scenes.

There are many films, however, such as most of the Moody films and the Disney health films where the pictures illustrate the sound track and do not tell their own story. With these the commentator needs to be talking most of the time. A full synopsis of the film is of great help in his preparation. He may require to preview it several times in order to remember the order of its message. He may wish to use a shaded light with the commentary but the worst possible thing is to try to read prepared notes. He will usually find that the scene which he is trying to explain is gone before he finishes reading the notes he wrote.

PROJECTORS AND CURRENT

There are many makes of projectors, both silent and sound. The most recent British models of American projectors (such as Bell and Howell and Ampro) are now being made to run directly off 220 volt, 50 cycle A.C. current. However, all of the older models and any gotten direct from the States must have 110 volt, A.C. current. This is no problem if you have 220 volt, 50 cycle A.C. current, as in all more recent installations in India. A transformer, preferably of 1,500 watt capacity, solves the problem. However, in most Indian cities, where we wish to use our projector at the time of the peak load of early evening, a *variable voltage transformer* is a *MUST* With this, one can boost up the voltage in order to get enough current to produce a bright picture and enough volume of sound. The cost of such a variable transformer will be about Rs. 350. Incidentally, I always run our sound projectors at 100 or 105 volts rather than the usual 110 volts, except under adverse conditions such as showing to a huge crowd outdoors (1,000 or more) or on a large screen (over 8′ x 10′). This protects the bulb and the valves (tubes) against occasional violent fluctuations of the current. Also if a bulb rated at 110 volts is used at 100 volts, its life will be approximately 300% longer thus. The same is true of the valves, photo electric cell, etc.

(If at 120 volts, it will last about 30% as long). And for some of us these replacement expenses are quite an item!

If your source of current is 220 D.C., as is often true in older installations, your problem is MUCH more difficult. A qualified mechanic (such is difficult to find!) can modify the wiring of your projector so that a 220 volt bulb can be used direct from the mains. This is about 75% of the load of a sound projector. The sound system must have A.C., 110 volts. You must get some kind of an inverter (or convertor) either rotary or with a vibrator that will change the 220 volt D.C., into 110 volt A. C. In this problem you should consult with some qualified person, such as one of the secretaries of the N.C.C. A-V.A. Committee.

A very few projectors (such as the Natco) will run on either 110 volt A.C. or D.C. In this case you can use a resistance (rheostat), *of sufficient* capacity, preferably variable, to use your projector with 220 D.C. current. This resistance burns up just half the current in the form of heat. The motors of perhaps all silent projectors will run on D.C., just as well as A.C., so that it is possible in India to get such a resistance which is fitted to your particular silent projector. But take care that both the motor and the light (as well as the pilot bulbs) are *both* turned on and off at the same moment, preferably by the master switch on the wall or connection cord. Otherwise, there is great danger of burning out the motor. And if the bulb should burn out, replace it with another of exactly the same wattage.

When using a sound projector, especially with such a resistance, in a place you have not previously used, be sure to first see the capacity of the meter and the fuses. These should be of at least 10 amperes. If the meter is of only 5 ampere capacity, don't! Set up your projector and test it preferably several hours ahead of time. Extra fuse wire should be at all times in one of the compartments of your projector case.

MAGNETIC SOUND

The most exciting new development in sound projection for amateurs is the development of a magnetic sound stripe on 16 mm. film (as well as 8 mm. film). This is an iron oxide compound, embedded in some kind of lacquer, put on the film as a narrow band. It may be 10 miles (or one centimeter) wide put on single sprocket hole film where the optical sound track would usually be found, or half this width put on alongside the optical track, or quarter width put on ordinary silent film with double sprocket holes. In any case it works exactly like the same material on tape used in a tape recorder.

This stripe is put on after development and any splicing and editing required in a film. If both the magnetic sound stripe and the optical sound track are on the same film, either can be used, switching back and forth as one pleases. The recording is done with

a microphone while the film is being projected and as with a tape recorder, the track may be erased and re-recorded as one wishes.

The possibilities this opens up for us are many. It is easy to translate the commentary for any language group as we desire. We hope that it may be possible to sound track all of the films in our Library and put a basic commentary on some in major languages and make others available for Patrons of the library to put on their own regional language.

Just now there are two difficulties. First the need for an attachment to use with existing projectors so that the magnetic track may be played (even if not recorded) with any projector. At the present time Ampro and Victor are the only projectors that have a separate unit for utilizing the magnetic stripe, but they can be used only with an Ampro or Victor sound projector respectively. Others are working on this problem and we feel that it is only a matter of time till such attachments will be available.

The second necessity is that we have an adequate arrangement for putting the stripe on to all the films in our libraries and also on prints we have made from master negatives at Bombay (KING OF KINGS, TRANSFORMED LIFE, etc.). The cost of this stripe in the U.S.A. has come down to 2½ cents per foot, or nearly Rs. 50 for a 400-foot reel. One firm in Bombay hopes to be able to have a striping machine. We also have been assured by RAVEMCCO that they will soon be able to supply us with such a machine for our own use. We await further developments with the greatest of interest.

PROJECTION SCREENS

A proper screen is just as important as a good projector. But how often have we seen a thin muslin sheet used which lets most of the light through, never to be reflected back to be seen by the audience.

There is a great variety of screens on the market, matte and beaded, on tripods, rollers and with grommets to be stretched on some kind of frame.

First; matte *vs.* beaded. A beaded screen has an enormous number of solid, tiny round glass beads spread out to a single layer and embedded in some kind of a binder on the cloth fabric. The light striking these is reflected internally in each of these glass spheres. Almost all of this light is reflected almost directly back, within an angle of about 15° on all sides of the line of projection. Therefore, a picture projected on such a screen is very bright indeed as seen by those persons sitting within a total angle of 30°. Projected on a matte screen, the light is almost equally bright for all persons including those sitting much further to either side. Therefore, choose a *beaded* screen if you are to show pictures at the end of a long, narrow hall. If you must show pictures on one side of this same hall, where many

people will have to sit far-off to either side, choose a *matte* screen. And if you are to show pictures out of doors, such as on the athletic field of a school or in a village, by all means use a *matte* screen. No amount of persuasion will get people to sit in front of the screen at some little distance away, rather than up close at a great angle. They have learned that at any function where a person is speaking, the closer they can get, the better. They cannot realize that in the projection of a picture, other considerations enter in.

For all-round use, I strongly recommend the matte screen. If one gets a beaded screen, make sure it has been protected against mildew. This usually costs 5% extra. At least half of the beaded screens I have seen in India have been ruined by the fungus growth. This is easily recognized by the spots of all sorts which are seen when a picture is projected. What can be done for such? Nothing. If you wish, you can try scraping the whole surface and applying a matte white paint—but it will no longer be a beaded screen!

Shall one get a screen on a tripod, collapsing into a box, on a roller or with grommet holes to be stretched on a frame? This depends largely on your pocket book and the use you wish to make. The tripod variety is the most expensive, weighs the most and in some ways the most convenient. If you use it out of doors, be sure to attach several fine guy ropes to prevent a sudden gust of wind upsetting it or a child bumping against it. For a school hall the screen in a roller that can be left hanging high on the wall at all times is easiest. Avoid pulling it out past the "stop" point. In time the spring will get weak and require adjustment. A screen collapsing into a box can usually be set up easily on two chairs or a table, even in a village—again with guy ropes. If you want a screen larger than 5′ or 6′ across, it is essential that you use one with grommets.

An excellent matte screen can easily be improvised. A white-washed wall at the end of a hall can scarcely be improved upon. I know of one school (Moradabad, U.P.) where a wall has been built so that on one side there is a large white-washed cement surface. The projector is on the verandah facing the wall, the audience sits in between, an excellent arrangement in the hot season (but not in the monsoon). A large sheet of cardboard, of plywood or of building material such as masonite can be white-washed with several coats and thus used. If you must use muslin sheets (and we hope you won't) stretch two on top of each other, as the second sheet stops some of the light which goes through the first.

How large a screen is needed? This depends, of course, somewhat on the power of the bulb used in the projector. Most modern projectors have ample power. One reads in books on projection that the audience should not be closer than twice the width of the screen or further than six times the width. That is, using a 5′ screen, they

should be seated between 10′ and 30′ from the screen. This is doubtless a counsel of perfection, for many times I have used such a screen in a 60′ hall with excellent results and occasionally in such a place as the Cathedral at Allahabad where some people were sitting as much as 100′ or more from the screen. I do not recommend this, but it was all that could be done. I was not able to use a larger screen. The brightness of the screen makes up in part for the smallness of the image.

In any case, the bottom of the screen MUST be at least as high as the heads of the people viewing it, whether sitting or standing. This is very important, unless there is a natural slope of the ground or floor down to the screen. If you are using a speaker, get it up high, even on a pole, pointing towards the middle of the audience. Remember if a person speaks, he *stands up* to be heard, and usually gets onto a platform if the crowd is large.

While the use of motion pictures and the operation of projectors is left to other chapters a brief summary may be helpful:

1. Vitalize your teaching in church or school with motion pictures.
2. Order film catalogues from reliable sources. (Chapter 26)
3. Order films well in advance with substitutes.
4. Please read the rules and instructions in the catalogue.
5. Preview all films and fill in the forms enclosed with your film.
6. Set up projector and have image focused before group meets.
7. Have spare bulb, etc., at hand.
8. Check the fuse.
9. Prepare your group.
10. Strive for a smooth professional effect.
11. Follow-up.
12. Return film, service fee and report form promptly.

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Chapter 26

SOURCES OF FILMS FOR RENT IN INDIA

H. R. FERGER[1]

GENERAL RULES AND SUGGESTIONS

1. Catalogues are available free from all of these sources except those for the N.C.C. Film Libraries.
2. Films are sent by registered parcel and must be returned in the same way.
3. For 16 mm. silent films the standard reel is 400 ft. Running time is 18 minutes. For 16 mm. sound films the standard reel is 400 ft. The running time is 11 minutes. Sound films often come on larger reels such as 800 ft., 1,200 ft., 1,600 ft. and a very few on 2,000 ft. reel. Be sure you have a take-up reel of each size.
4. The user is responsible for damage of all kinds while using the films.
5. To show SOUND movies you *must* use a sound projector. A sound film will be damaged beyond repair if projected on the usual silent projector.
6. We list below all of the sources of films in India where they may be had on rental so far as we have been able to discover. However we know that in each of the larger cities of India there are local libraries which rent films for local use. Enquire about these from your local dealers. Most of the States of India have a lending library in connection with their Department of Education. Your Inspector of Schools should be able to give you this address.

Source: National Christian Council Film Libraries—

South India—Mr. V. M. Mathew, Arogyavaram, Dist. Chittoor, S.I.

[1] Rev. H. R. Ferger, B.D., M.A., Jumna, Allahabad, has been loaned by the Synodical Board of the North India American Presbyterian Mission and the Presbyterian Board of Foreign Missions in the U.S.A., to be the Field Director for North India of the Audio-Visual Aid Committee of the National Christian Council. He is a pioneer in visual aids, a noted photographer and skilled cinephotographer.

North India—Rev. H. R. Ferger, P.O. Agricultural Institute, Allahabad, U.P.

Silent or Sound: Both silent and sound, also 35 mm. filmstrips, Kodachrome slides and phonograph records. A few tape recordings.

Type: All kinds, especially religious. Catalogues -/4/- to -/8/- plus postage.

Rules: No deposit is required. Material must be used a minimum of once in three days or service charge paid. Always give details of when material is to be used and for how long.

Rates: For each 400 feet of movie film, service charges are thus: black and white sound Rs. 2-4, silent Rs. 1-8; colour sound Rs. 4-8, silent Rs. 3. Subsequent use half this charge for each use. Filmstrips; black and white As. 8, colour Re. 1. 50% discount is given to all Protestant Mission and Church organizations. A few films and a number of filmstrips are available for sale.

Source: Films Secretary, Office of the High Commissioner for Canada, 4 Aurangzeb Road, P.O. Box 114, New Delhi.

Silent or Sound: Sound only, English sound track, some in colour, total of over 150.

Type: Largely of Canadian life but some musical, sport, health, industry, etc.

Rules: No deposit fee. No admission is to be charged. Return charges to be paid. Normally films are booked for one showing only but the time may be extended. In general maximum of 60-minute programme permitted.

Rates: No rental fee.

Source: Sub-standard Distribution Co., 1 Humayun Place, Calcutta 18. Also Bombay, New Delhi, Madras. Distributors for J. Arthur Rank films.

Silent or Sound: Sound only, English, over 50 films available. Some 8 Indian films are listed.

Type: Chiefly feature films, entertainment (as Great Expectations, Red Shoes, Oliver Twist, Henry V, Hamlet, A Queen is Crowned).

Rules: Usually no deposit is required from educational institutions. Only for non-commercial, non-theatrical use.

Rates: Rs. 60 for black and white, Rs. 75 for colour with a few exceptions. Insurance, freight, etc., must be paid both ways.

Source: Paramount Films of India, Ltd., Post Box 623, Bombay 1. Also Calcutta, New Delhi, Madras.

Silent or Sound: Sound only, English sound track, about 80 in number, some coloured.

Type: Feature films, entertainment (as For Whom the Bell Tolls, Shane, Cleopatra and Greatest Show on Earth).
Rules: No deposit probably required from Christian institutions.
Rates: "Rental rates depend on where the film is to be shown, the number of people who attend and the paid admission"

Source: Office of the High Commissioner for Australia, Connaught Place, New Delhi.
Silent or Sound: Sound only, a few in colour. Approximate 150. English only.
Type: Documentary of life in Australia.
Rules: No deposit fee. No admission is to be charged. Return charges to be paid. Normally films are booked for one showing only but time may be extended. Only one coloured film can be included in a programme.
Rates: No rental fee.

Source: United Nations, New Delhi Information Centre, Theatre, Communication Building, Queensway, New Delhi.
Silent or Sound: Sound only, Approximately 50. English only.
Type: Documentary, in general of work of the many sections of the U.N.
Rules: No deposit fee.
Rates: No rental fee. Also available for sale.

Source: Patel, India, Ltd., 190, Hornby Road, Bombay.
Silent or Sound: Both, some 400 films; a few in colour.
Type: Entertainment; sound track English and Hindi.
Rules: Deposit fee of Rs. 250 to 1,000. Charges to be paid both ways.
Rates: From Rs. 2 per reel to Rs. 100 for feature programme. 50% reduction for additional days. Only for non-commercial use.

Source: United States Information Service, 54 Queensway, New Delhi. Also Bombay, Calcutta, Madras, Lucknow, Hyderabad, Bangalore and Trivandrum.
Silent or Sound: Sound only. Approximately 400 films with sound track in English and also some films in each of Hindi, Bengali, Urdu, Gujarati, Marathi, Tamil and Telugu at certain centres. See their catalogue. Also nearly 300 filmstrips (some in colour) and several sets of slides.
Type: Documentary, largely of life in U.S.A. but also many on health, agriculture, industrial work, medical films, etc.
Rules: No deposit fee. No admission fee is to be charged. Return postage to be paid.
Rates: No rental fee.

Source: British Information Service, Eastern House, Man Singh Road, New Delhi 2. Also Bombay, Calcutta and Madras.

Silent or Sound: Mostly sound, a few silent, a few in colour. Mostly English with a few available with sound tracks in Urdu and Hindi. Over 500 in number.

Type: Documentary, largely on the British Commonwealth, but also many on agriculture, education, medicine, industry, etc.

Rules: No deposit fee. No admission is to be charged. Return postage to be paid.

Rates: No rental fee.

Source: Metro-Goldwyn-Mayer, India, Ltd., Post Box 837, Bombay. Also Calcutta, New Delhi and Madras.

Silent or Sound: Only sound with English sound track. About 150 package programmes available each of about 2 hours length.

Type: Largely entertainment, a few educational, etc.

Rules: Deposit of Rs. 150.

Rates: Rs. 60 per show for most programmes: Rs. 85 for "special"

Source: R. K. O. Pictures Ltd., Post Box 733, Bombay. Also Calcutta, Madras and Delhi.

Silent or Sound: Sound only, English sound track; approximately 100 films.

Type: A few documentary (as Walt Disney "Seal Island"); mostly entertainment, including a few full length cartoons (as Snow White and the Seven Dwarfs).

Rules: Deposit of Rs. 250.

Rates: Depend on size and nature of audience.

Source: Officer-in-Charge of Distribution, Films Division, Government of India, Haines Road, Mahalaxmi, Bombay 11.

Silent or Sound: Sound only; English, Hindi, Bengali, Tamil, Telugu. Silent prints can be obtained by special request.

Type: Around 150 documentaries are available, with one new one issued each month. Farming, Indian art, education, food, foreign relations, citizenship, health, India and her people, industry, communication, etc.

Rules: Deposit of Rs. 100 as earnest money. No almission to be charged. Freight, packing and forwarding charges to be paid both ways.

Rates: Rs. 3 per film for the first day, Rs. 1-8 for each subsequent day. "In case of exhibitions, fairs, charitable institutions supply of film is made free of rental, on merits of individual case" Sale of prints Rs. 120 per print up to 400 ft. (25% additional for every 100 ft. or part thereof) and Rs. 100 to " Charitable and Educational Institutions, Hospitals, etc."

Source: Ministry of Education, Audio-Visual Aids Section; Secretariat, New Delhi.

Silent or Sound: Both silent and sound. Chiefly English, a few Hindi. 1,700 films are available.

Type: Educational (including medical) of many sorts from many Western (as well as Indian) sources as Castle, McGraw Hill, Unesco, Coronet, Encyclopedia Britanica, Nat. Film Bd. of Canada, etc.

Rules: No deposit required. Films may not be kept more than a week at the longest.

Rates: No rental charged, nor may entrance fee be charged. Return registered parcel post charges are to be paid.

Source: Director-General of Health Services (Publicity Section) New Delhi 2.

Silent or Sound: Almost all sound: a few silent. Sound track some English; some Hindi. About 180 all told. Also some 32 filmstrips (some in colour).

Type: Mostly on health and hygiene subjects; some of the Government of India Information films on the heritage of India.

Rules: No deposit. Material is to be returned within a fortnight of receipt, by registered, insured post.

Rates: No rental charged.

Source: Burmah-Shell Co., Connaught Circus, Box 7, New Delhi. (Also from Bombay, Calcutta and Madras). 125 films all told.

Silent or Sound: Mostly sound, a few silent. Sound track in English except seven in Hindi. Some are only 35 mm. sound films.

Type: Mostly on oil: drilling, refining, products, etc. Some on aviation, engines, horticulture, science, etc.

Rules: No deposit required.

Rates: No rental charged.

Source: National Education and Films Ltd., National House, Apollo Bunder, Bombay.

Silent or Sound: Sound, chiefly in Hindi.

Type: Entertainment. Some 50 are Indian feature films.

Rules: No admission charge can be made. Deposit of Rs. 300 to Rs. 750 is required. This may be waived for selected organizations.

Rates: Black and white 400′, Rs. 4-8 for first showing: half this for subsequent uses. Rates for feature films given on application.

They also are agents for a number of foreign producers of films, such as Coronet Instructional Film, Films of the Nations, McGraw Hill International Corp., Bray Studios, United World Films (all of these of U.S.A.) and Common Ground of London. They also sell filmstrips of common ground.

London and others. Those interested should write for information.

Source: Central Film Library, Ministry of Education, New Delhi.

Silent or Sound: Both silent and sound, English and Hindi about 3,000 all told.

Type: Documentary, entertainment, instruction, etc.

Rules: No deposit. Films may be retained not more than one week. No entrance fee may be charged. Borrowing organizations are required to "enrol as a member on a yearly basis".

Rates: No rental is charged.

Source: Al Mervyn Studio, Lucky Mansion, 79 Ghoga Street, Fort, Bombay.

Type: Some 700 slides on India, famous places, mountains, trade, transport, industry, people, agriculture, Kashmir are available for purchase only: black and white Rs. 1-4, colour Rs. 2 each. Some 80 filmstrips, 20 to 24 double frame pictures to each are available for Rs. 9 each. These are of Indian life, places, etc. Hand coloured extra. Also 10 Catholic religious filmstrips and 10 other religious filmstrips.

Chapter 27

THE MOBILE VAN

GURBACHAN SINGH[1]

ONE night we were showing a 16 mm. film, "The Tennessee Valley Project" in a mid-India village. After the programme a farmer got up, stretched himself and remarked with a deep sigh, "If we only had water like that"

This simple man learned a great truth in two hours, and he understood it so well that he did not require any further explanation. From the way he expressed his surprise and also a sudden realization of his and every other farmer's vital need it was clear that he had never understood it so clearly before. It is often difficult to help farmers understand their needs by lectures. They are suspicious of city people and often misunderstand their motives. Their minds are not trained to grasp truths by abstract reasoning. But when they see a thing through demonstration or film they can understand the message and will be moved to action.

Another time we were showing, "Kings of Kings" in Raipur. The programme was in the open and many women were in the audience of whom the majority were non-Christian. When the scene of the Cross came on the screen there was profound respect and one could hear some persons sob. It was such a touching scene that irrespective of religious affiliation the people were influenced by the injustice done to Jesus. They saw and understood.

Certain Christians have not yet overcome their biasness against audio-visual aids. They still compare them to commercial cinemas and thereby decry them as an un-Christian method of Christian work. Disregarding such biases one has to accept the fact that the audio-visual method meets a great need. It is undoubtedly a great friend and powerful tool of the Church and every other organization which aims to instruct people. It is an effective method of teaching and is potent with all age groups.

But audio-visual equipment, especially projection equipment, is not readily available in India. In cities and large towns there are

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[1] Rev. Gurbachan Singh, B.A., B.D., Superintendent, Gass Memorial Centre, Raipur, M.P., is a member of the A-VA Committee of the National Christian Council.

commercial cinema houses but it is not satisfactory to make use of their facilities regularly in our programmes because their rent is very high. Occasionally we rent a public cinema hall for a Christmas or Easter programme.

Even 16 mm projection equipment is expensive to purchase and maintain. Every institution or Church organization cannot afford to buy and maintain a unit. Furthermore, technical skill is required to operate a projector, turntable and tape recorder. More skill is required where electricity is not available and a gas-electric generator must be used. Such problems multiply when equipment is housed in a mobile van. Hence in a long range programme a mobile unit conserves equipment, reduces capital investment but increases problems of personnel. At the same time it is not easy or practical to reach villages far from the Centre without a van in order to give them the benefit of music, film and tape programmes. Carts, tongas and mules are easily available and may have to be used where there is no other vehicle but they are out-dated means of conveyance and certainly not very quick and convenient. The answer is a mobile unit which is a self-contained unit that can be moved from place to place and be ready for work on arrival.

What is a mobile unit or van? I think of a number of vehicles such as a car, a station wagon, a half-ton truck as well as those huge trucks used by the Publicity and Social Education Departments.[1] I inspected one recently and made a careful study. These large trucks do have advantages over other smaller types of vehicles. They have enough room to house all the equipment and provide accommodation for a projectionist, a driver and the officer in charge of the van. The projector and the generator are permanently fixed and hence they are properly mounted against damage from jolts and protected from dust.

However, they have their limitations. These vans are so large they become uneconomical. Fuel consumption is high and they cannot go into the interior away from metalled roads in the rainy season. This limits their usefulness to dry season, touring, or to villages along the roadside.

Some persons consider the Jeep is the answer to a mobile unit. It is light, gives good mileage and on account of its four-wheel drive can ply any kind of road, or no road, in any season—wet or dry. But the Jeep is small and generally open so that on village roads it gives little protection from dust. Please remember dust is one of the chief enemies of our equipment. Furthermore, after you have loaded all the equipment there is very little room left for personnel. Equipment in an open Jeep is subject to pilferage and theft.

[1] Read Rev. T. Essebaggers article on Mobile Van in the Audio-Visual Handbook, 1950 Edition, Pages 39-43.

It is possible to prepare a separate trailer suited to your needs and hitch it to the Jeep. I personally would like to have a Jeep station wagon for my mobile van. It is large enough to carry all your equipment as well as a group of half a dozen men. Since it has a factory-made body it is as free from dust as any car. You appreciate such a vehicle still more if you have to come back from the village programme and work at your desk.

I have built a dust-proof body on a half-ton Chevrolet at a cost of Rs. 600. It has three windows on each side and a door in the rear. The body rests on four angle-irons with iron-sheet roofing and hard-board ceiling. These iron sheets are welded to the sides which make the cabin dust-proof. I can carry 9 to 12 persons on the three seats inside the cabin. One full seat is on the front side of the cabin with a full size tool-box underneath and the two other seats, on the other two sides fold when not required. I find it very handy in every way because I can take 10 persons with me plus all my equipment. But you do not always need 10 persons. The minimum number required for an efficient management of a mobile-van is two. Three would be better if the budget permitted. One is the driver who should also be a projectionist. Then a commentator is necessary. A third person to attend miscellaneous jobs is helpful if the van is on tour many weeks. I have found it helpful and rather necessary to have one man to look after the generator and keep the flow of electricity steady.

Even though equipment may be safe in a closed van it is advisable to house them in wooden boxes. These boxes can be made dust-proof. I have made wooden boxes for our projector, loud speaker, public address system and battery, etc. They are neat, handy and strong enough to stand the weight of one person if it is necessary to use them as a "chair".

Chapter 28

TIPS ON OPERATING EQUIPMENT

JONATHAN C. LYALL[1]

ONE of the advantages of the 16 mm. cine projector and the 35 mm. filmstrip projector is—portability. Unlike the fixed projection arrangement of the local movie theatre, a 16 mm. cine show can be held under all kinds of conditions—indoor or outdoor—in a school hall or community centre or even underneath the stars in an isolated rural place.

Under these widely varying conditions, putting on the best show possible depends largely on the skill in handling the equipment and the techniques of good showmanship. No matter how good the photography or how valuable the aid, a good deal of its value may be lost, if it is given poor handling in projection. For good projection is the final realization of all the art and skill which has gone into picture making. The best projection goes unnoticed, while poor projection is marked by distractions and interruptions.

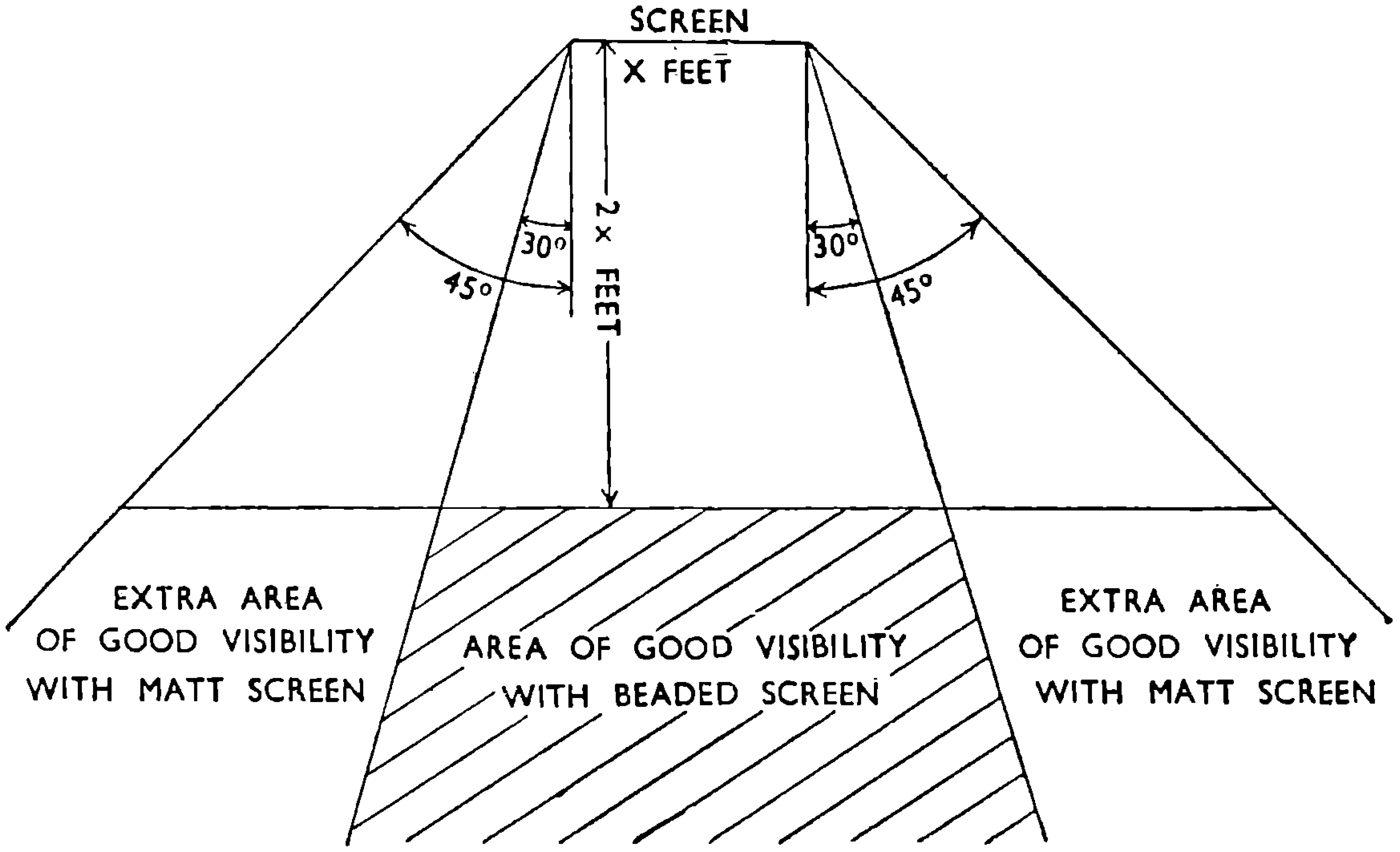
Good showmanship implies familiarity with the mechanism of many varied types of audio-visual equipment; a sense of good theatre and basic knowledge of successful procedure to assure the nearest to perfection which can be achieved in putting images on the screen and reproducing sound. The basic skills in handling the equipment can be acquired through careful study and practice.

ROOM ARRANGEMENT AND SEATING

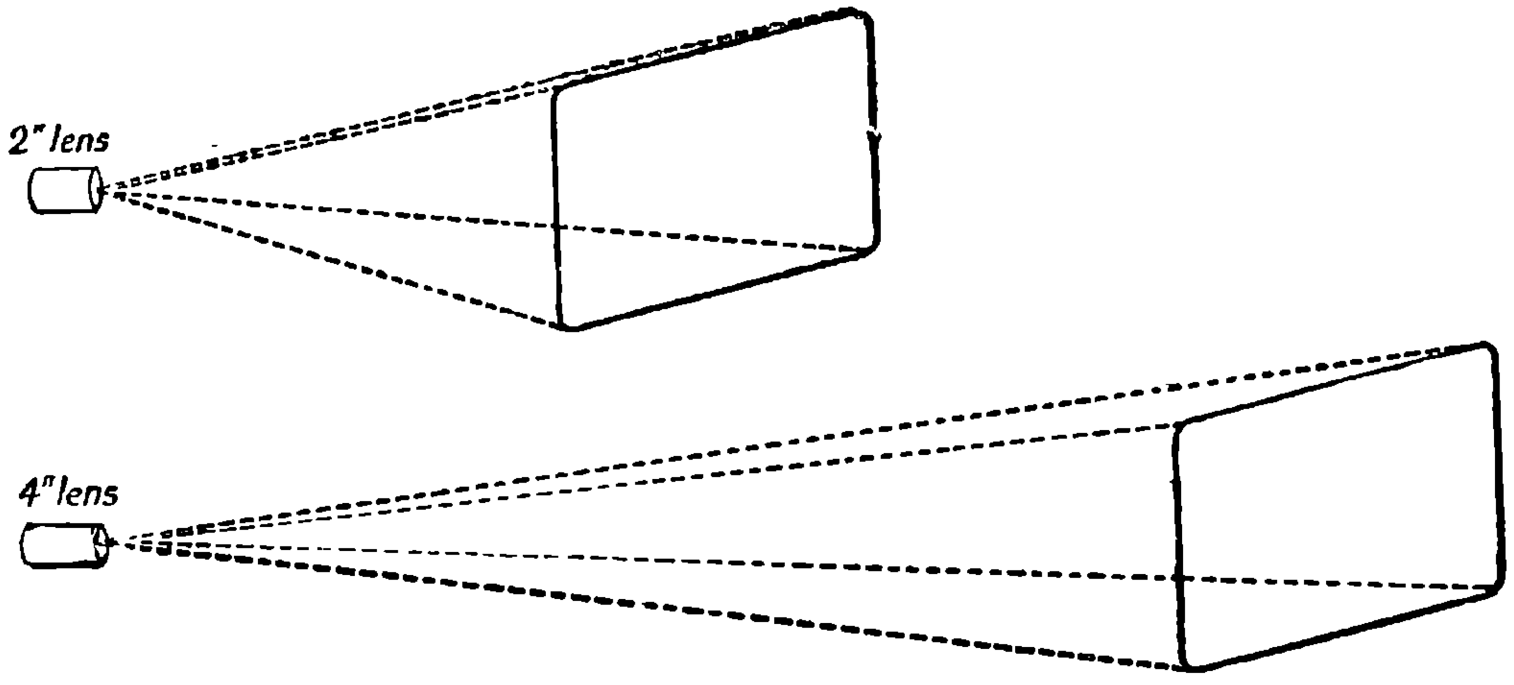
Generally speaking the projection room should be longer than it is broad, and may be equipped with black-out material so as to make it possible to darken it for projection purposes without too much distraction. Attention must be given to the way in which the audience is to be seated. The distance of the farthest seat from the screen should not be more than six times the width of the picture. The audience should not be seated closer to the screen than twice the width of the picture. The "Viewing angle" from which spectator see the picture must be carefully considered. The

[1] Mr. Jonathan C. Lyall, M.A., Allahabad, U.P., Director, Audio-Visual Aids Committee of the India Council, Presbyterian (U.S.A.) Mission, has specialized in filmstrip production at Ohio State University.

best general rule to be followed is that the boundary of satisfactory area in relation to the screen position be limited to a maximum of 30 degrees. This condition is approximately fulfilled when no row of seats is longer than its distance from the screen. If people be



seated at the ends of front rows the pictures will be distorted for them without their realising the reason for distortion. In case a beaded screen is used, pictures will also be much less bright from the side angle.



The size of the picture projected will depend partly on the distance from lantern, to screen, known as the throw, and partly on the focal length of the lens. The focal length is the distance from the slide at which the lens must be held in order to project a sharp picture on a screen at a distance. In the illustration above we see

that changing a 2″ lens to a 4″ lens will permit the projector to be used in a long narrow room with a long throw.

OPERATING A 16-MM. PROJECTOR

Proficiency in the operation of a 16 mm. projector demands skilful projection, free from delay, distractions and "trouble" The following procedure and suggestions will help in overcoming last-minute difficulties frequently encountered by those engaged in the operation of projection equipment.

SETTING UP EQUIPMENT

1. Read CAREFULLY the directions which accompany the projector. These along with the threading chart should be fastened inside the projector case where they will not be lost.

2. Check the equipment before use. Clean the machine according to instructions. Film gate, the lens, mirror of sound optical system and the condensers should be FREE of dust.

3. Place the projector at the rear of the room on a stand or table of a height which will permit projecting over the heads of the audience.

4. Place the screen high enough so that everyone can see the entire picture.

5. If using sound equipment put the speaker near the screen and off the floor. Placing the speaker on a cardboard box will help.

6. Arrange the extension cords so that people will not stumble over them in the dark.

7. All switches should be OFF before plugging in cords, silent-sound and forward-reverse switches should be set properly.

8. Cords must be unlinked and FIRMLY inserted.

9. Remove loose parts such as extra empty reels, etc. from speaker case.

10. Aim and focus before threading. To do this first turn on motor and lamp. Then adjust projector to screen so that the light fits the screen in such a way as it is neither larger nor smaller than the screen. Remember the closer the projector to the screen the smaller the picture. The farther the projector from the screen, the larger the picture will be.

THREADING THE FILM

1. If using sound equipment, turn ON amplifier to warm it up. If you can hear a small cracking sound as the volume control is turned on and off, the amplifier is ready.

2. Check film to see if it is properly wound. Frames should be UPSIDE-DOWN beginning with the title. Silent film has sprocket

holes on both sides, sound film on only one side. The sound track (wavy lines on side of the film) must not be threaded in the sprocket teeth. DO NOT USE SOUND FILM ON A SILENT PROJECTOR. Be careful of film especially of SOUND TRACK. Experienced operators even make mistakes.

3. Allow enough loose film (about 2½ feet or so) to thread the projector and to reach the take-up reel.

4. Top sprocket; film placed properly, held and locked.

5. Swing film gate lever upward to open the film gate. There must be a proper size loop on the film before it goes in the film gate and just after it goes through. This is necessary because the film moves intermittently and slack must be allowed. Pass the film through the channel behind the lens being certain that it is fully seated in this channel. Close the film gate.

6. Second sprocket: Film placed properly, held and locked.

7. Third sprocket: Film placed properly, held and locked.

8. Allow proper tension on the film over the sound drum. If the film is not snugly seated around the sound drum, the sound will be fuzzy.

9. Place the film around the bottom of the take-up reel, and revolve the reel clockwise to remove film slack.

10. Check film in each sprocket. Turn clutch control to the extreme clockwise position, then turn hand-power knob, several clockwise revolutions to engage the film with the shuttle teeth; to see if the film properly goes through the gate and on to the take-up reel. Should the lower loop slide upward, open the gate and reset the loop to the outline on the gear case.

PROJECTING THE FILM

1. Start the motor, turn on the sound and adjust the focus. To sharpen focus, revolve the lens first in one direction and then in the other until the point of maximum sharpness is found. If you have time to get ready, the film should have passed the numbers on the leader strip and open directly on the title with the film in focus.

2. Frame the picture properly. An improperly framed picture has part of a second picture showing at the top or the bottom of the screen. There is a framing mechanism that adjusts this. If framing moves the picture off the screen readjust tilt adjustment knob.

3. Check film by feeling edge before it enters the take-up reel.

4. Adjust proper volume for audience. The volume control operates similarly to volume controls on radio sets and either sufficient volume for the largest room or minimum volume for the smallest

room may be achieved. Advance or retard it as necessary to produce the desired volume of sound.

5. Adjust best tone for audience (high for speech, low for music). The tone control is also operated similarly to a tone control on a radio receiver. By means of this control, frequency range can be compensated for in accordance with the acoustical conditions under which the equipment is being used. At each showing set it for the most desirable reproduction.

STOPPING ON FILM

(For projectors with clutch)

1. Turn down volume.
2. If no picture appears, turn by hand setting knob. (Some models have "still lever").

CONTINUE PICTURE: THEN REVERSE FILM

(For projectors with reverse lever or reverse switch)

1. Turn down sound volume.
2. Stop motor before reversing.

STOPPING

(End of film)

1. Turn down sound volume.
2. Turn off lamp (to prevent white screen).
3. Turn off motor.

REWIND AND PACK UP EQUIPMENT

1. After the reel has been run through, you may want to rewind it. The rewinding mechanism is not the same on all projectors. It is a mechanism that enables the take-up reel to run faster than it did when the film was unreeled.

2. After the show disconnect cords. Coil cords neatly and pack up the equipment.

FILM CARE AND MAINTENANCE

The Common sources of Film Damage are:

1. Equipment in poor condition.
2. Dirty projector.
3. Improper threading.
4. Careless rewinding.
5. Incorrect splicing.
6. Thoughtless handling of film.
7. Improper storage.

FILM DAMAGE CAN BE AVOIDED IF THE FOLLOWING PRACTICES ARE FOLLOWED

1. Keep projector clean and in good repair.
2. Thread projector PROPERLY.
3. Occasionally check film as it goes on take-up reel for damage.
4. Avoid use of bent reels.
5. Rewind and inspect film carefully. Repair breaks, tears, and torn sprocket holes. Make neat, strong and proper splices.
6. Store film in cool place.
7. Keep film off floor.
8. Never cinch film on reel.

SPLICING

Even the best of operators may break a film. Knowing how to properly splice a film is an important part of the operator's job. A film with a good splice is as strong as the original.

FOR A GOOD CLEAN SPLICE USE THE FOLLOWING PROCEDURE:

1. Clean splicer thoroughly.
2. Insert film in splicer, emulsion side (dull) up. Be sure perforations are seated on pins.
3. Cut film leaving clean cut edges.
4. Moisten exposed edge of film with water.
5. Scrape emulsion from film.
6. Wipe off excess water.
7. Apply fresh film cement. DO NOT USE TOO MUCH CEMENT. Place film in right hand lock on scraped edge of left hand film.
8. Apply pressure and allow cement to dry a few seconds.
9. Wipe off excess cement.
10. Check splice for strength, smoothness, and cleanliness.

CARE OF EQUIPMENT

1. *Question:* Approximately how MUCH and how OFTEN should a projector be oiled?

Answer: See manufacturer's instructions for your machine. One drop of projector oil after each 4 hours of operation at SOUND speed; and one drop of projector oil after each 16 hours of operation at SILENT speed is a general rule.

2. *Question:* How can you tell when cleaning of projector is needed?

Answer: "WHISKERS" around the projected light on the screen.

3. *Question:* How is the aperture or film gate cleaned?

Answer: Clean it with the brush provided; or a pipe cleaner; or with a soft cloth dampened with carbon tertrachloride, or with a soft wood stick, but NEVER with a metal object.

4. *Question:* How are the film channel, sprockets and sound drum cleaned?

Answer: Same as No. 3.

5. *Question:* How often is the above cleaning necessary?

Answer: Preferably before each showing and clean thoroughly once a week.

6. *Question:* What glass parts need cleaning and how?

Answer: Projection lens (front and back surface-NEVER take it apart). Condenser lenses. Clean them with soft, clean handkerchief, lens tissue, or kleenex. Lens fluid may be used if finger prints or oil are found on lens.

7. *Question:* How is the lamp removed for replacement?

Answer: See manufacturer's instructions. If burned during a show, remove it with a cloth otherwise you will burn your fingers.

8. *Question:* Where is the amplifier fuse located?

Answer: See your instruction manual. The fuse usually (2 ampere fuse) is near the cord receptacle on the back of the projector case.

9. *Question:* What precaution should be observed before removing and replacing the amplifier fuse?

Answer: Disconnect the line cord.

10. *Question:* What two spare parts are most needed?

Answer: Projection lamp and exciter lamp.

11. *Question:* When is the clutch used?

Answer: When rewinding film; when stopping-on-film (showing a "still"); when turning by hand to check threading.

CARE OF FILM

1. *Question:* What damage to film results if projector is not properly cleaned before use?

Answer: Scratches on the film surface and sound track surface.

2. *Question:* What damage results if projector is too frequently or generously oiled?

Answer: The film becomes oily.

3. *Question:* What causes sprocket punches in film?

Answer: Improper threading; sprocket holes of film not meshed with sprockets.

4. *Question:* What causes sprocket holes to be torn out?

Answer: Too small loops (one or both). On some models, take up adjusted for large reel when using a small reel.

5. *Question:* What would you do if you had rewound a film too loosely?

Answer: DO NOT pull the end of the film to tighten; rewind it again using light hand pressure on the reel from which the film is coming off.

TROUBLE SHOOTING

1. If the screen goes white, the film is probably broken.
2. If the screen goes black, the lamp is burned out.
3. If the picture stands still and the motor continues to run, you may have a broken belt from the motor, a broken clutch, or the clutch may be out.
4. If the picture stands still and the motor stops, you may have a burned out motor, a burned out motor fuse, or a broken electrical connection to the motor.
5. If the film jumps or chatters, the film is probably a poor one. Or your projector may need oiling or there may be dirt around the pull-down mechanism or the pull-down mechanism may be worn.
6. If you have a loss of loop, it may mean improper threading. You may have a poor film or a worn pull-down mechanism.
7. If part of the film is out of focus, your screen may not be at right angles to the path of projector. Or the mechanism which holds the films while passing the aperture may be faulty; or you may have a defective lens.
8. If your picture seems dim, the film itself may be the cause. Or your lamp or reflector may be soiled or deteriorated with age. There may be too much light in the room. Your screen may be dirty.
9. If your lamps burn out easily, you are using higher voltage than that for which the lamp is made, or your voltage is not properly adjusted.
10. If projector operates, but there is no sound and no light from the exciter lamp, your exciter lamp may have burned out. Your amplifier switch may not be ON. Your speaker cord may not be plugged in firmly at both ends.
11. If you have low-pitched, slow speaking in a sound film, you may have set silent speed instead of sound speed.
12. If the sound stops suddenly and the connections are all good; the photo-electric cell may have burned out.

SAFETY PRECAUTIONS

Modern audio-visual aids equipment is designed with the safety of the operator in mind. However, care must be taken in handling any piece of electrical equipment. In handling audio-visual equipment the following practices should be observed:

1. Never use a fuse of higher rating than specified.
2. Disconnect the power cord when checking fuse.
3. Never leave the projector while it is running.

4. Always use a cloth or lamp remover to change hot lamps.
5. Do not use worn or frayed power cord.
6. Keep a flashlight handy in case of power failure.
7. Secure projector and speaker so that there is no danger of them being knocked over.
8. Provide substantial stands for speaker and projector.
9. Keep sound and power cords out of aisle whenever possible.
10. Avoid excessive rewind speeds.
11. Do not clean projector gate or sprockets while running.
12. When operating sound projector in a D.C. area, keep ALL switches of the projector on ON position.

OPERATOR'S PROGRESS CHART

	Date	Approved
Sound Projector		
Silent Projector		
Combination Opaque and Slide Projector		
$3\frac{3}{4} \times 4$ Slide Projector		
2 x 2 Slide and Film Strip Projector		
Screens		

OPERATING AN INTERNATIONAL (COLEMAN) KEROSENE PROJECTOR

People in under-developed areas, where no electric supply is available are already familiar with the operation of pressure lanterns, and therefore they are apt to think that they do not need any instructions to operate this projector. Experience has shown, that it is very important to maintain this projector at a high standard of efficiency. The mantles should be undamaged and the lantern cleaned each day before use; as a fine layer of kerosene oil which is not always apparent to the human eyes, gets coated on the reflector, condenser and the pressure plate and greatly detracts from the performance of the projector. The lantern should be kept under full pressure, which presents no difficulties as it can be pumped up during the projection. Since this projector is fitted with a special Coleman lamp so it is important to know the following steps:—

1. *To Fill.*

Make sure Fuel Valve Stem is closed tightly to the right. Remove Filler Plug and fill Fount with kerosene. You may fill up

to level of Filler Plug Busing. Replace Filler Plug and tighten firmly with fingers.

2. *To Pump.*

Make sure Fuel Valve Stem is closed tightly. Turn Pump Plunger three full turns to left. Place thumb over hole in Pump Cap, pump 20 to 30 full strokes. Remove thumb—turn Pump Plunger to the right until tight. (Note: Instructions are stamped on the Pump Cap).

3. *To Put on and Burn off Mantle.*

Remove Bail, Ventilator and Glass Globe. Tie mantle to groove in Burner Cap with flat side of Mantle parallel to Generator so that it will not touch the Generator. Distribute folds of Mantle evenly; cut off surplus asbestos string. Light bottom of Mantle evenly with a match, let it burn until nothing but the white ash remains; let Mantle cool off a minute before lighting the Lantern. Replace Globe, Ventilator and Bail.

4. *To Light.*

Be sure that:

(*a*) The Fount contains fuel.
(*b*) Air pressure has been pumped into the Fount.
(*c*) That Fuel Valve Stem is closed tightly.

Now turn the Gas Tip Cleaning Lever several revolutions; be sure that Lever is left pointing DOWNWARDS. Fill Preheater Cup with alcohol or methylated spirits (petrol or kerosene not to be used) and light with a match through lighter hole. Allow flame to consume nearly all the spirits, then open Fuel Valve Stem three to four full turns to the left, and mantle will light.

5. *To Turn Out Light.*

Turn Fuel Valve Stem to right until closed. The light will dim and go out in a few seconds. It is not necessary to remove pressure from Fount.

CARE AND MAINTENANCE

1. *Fuel:*

Always use clean, fresh white kerosene, which has not been exposed to the air or to the light—otherwise you may expect a premature carbonisation of the Generator.

Clean Fount at least once a month and drain Fount through Filler Plug opening. This removes old, stale and dirty fuel and heavy sediment which causes rapid carbonisation of Generator.

2. *Pump:*

Keep Pump Leather soft with a few drops of oil every month.

3. *Mantles:*

Use only Coleman Mantles—they give more light and are stronger. After you have put on and burned off a new Mantle, do not move Lantern for half an hour—it takes this long to bake the mantle and increase its shock-resisting qualities.

4. *Automatic Tip Cleaner:*

When Tip Cleaner Lever is revolved, the Cleaning Needle inside the Generator is forced up and down through the Generator Gas Tip, cleaning the Gas Tip Orifice. The Cleaner Lever should be operated when lighted lantern fails to burn bright after Fuel Valve Stem is wide open.

5. *When Putting Out Lantern:*

It is a mistake to put out the lantern through turning Cleaning Needle Lever up; this is not a positive shut-off; the light will go out, but fuel will continue to pass through the Generator. For the correct way to put out Lantern, see instructions.

TROUBLE SHOOTING

1. *If Lantern blazes up and smokes when you light it:*

Cause: Incorrect lighting—this is nothing serious.

Remedy: Close Fuel Valve Stem immediately, and relight lantern, following instructions.

If Lantern does not light at all:

Cause: No fuel, or insufficient air pressure.

Remedy: Put in fuel, and pump sufficient pressure in Fount; follow instructions carefully.

Cause: Generator clogged up by dirt or carbon.

Remedy: Put in complete new generator.

3. *If Light grows dim or goes out suddenly:*

Cause: After pumping pressure in Fount, you may not have screwed Pump Plunger completely to the right, and tightened it, which is essential.

Remedy: Follow instructions.

Cause: Fount may leak air.

Remedy: Place Fount containing air pressure in bucket of water: if air bubbles come from Filler Plug, put in new Filler Plug Gasket. If this fails to correct condition, use new Filler Plug complete. If air bubbles come from around the Bushing where Valve Body screws into Fount, be sure connection is tight. If air bubbles come out of Pump Barrel be sure to tighten Pump Plunger completely to the right.

4. *If a fuel leak develops at lower end of Generator:*

   Cause: Jamb Nut improperly threaded on Fuel Valve Body.

   Remedy: Tighten Jamb Nut with Wrench. If leak continues, put on new Jamb Nut—if this does not stop the leak, then the trouble is with the Valve Body which should be replaced.

5. *If Generator lasts only a short time:*

   Cause: May be due to use of old, dirty or treated fuel.

   Remedy: Drain and clean Fount thoroughly. Use Coleman Filter Funnel when refilling Fount with fresh fuel.

6. *If Mantles turn black:*

   Cause: Dirt in Screen of Burner Cap.

   Remedy: Unscrew Burner Cap and clean screen. If impossible to clean replace Burner Cap and Screen with new one.

7. *If Pump does not work:*

   Cause: Pump Leather may be dry.

   Remedy: Remove Pump Plunger and apply to Pump Leather a few drops of oil; or if Pump Leather is worn out, replace with new one.

   Cause: Ball in Check Valve is stuck.

   Remedy: Remove Pump Plunger—unscrew Check Valve; wash thoroughly in kerosene or petrol; make sure the chrome nickel ball has "play" in seat—if Pump still does not work, replace Check Valve with new one.

   Cause: The seat of the Pump Air Stem which screws into the Check Valve may be damaged.

   Remedy: Replace with new Air Stem.

8. *If Pack Nut on Fuel Valve Stem develops leak:*

   Cause: Packing Gland in Pack Nut may have shrunk. This may happen in dry climates and especially in the tropics.

   Remedy: Tighten Pack Nut with Wrench slightly until you notice friction when turning Valve Wheel. Should this fail to stop leak, put in new Packing Gland.

OPERATIONS TO BE LEARNED

Sound Projector		*Combination Opaque and Slide Projector*	
Remove from cases and set up for operation	——	Remove from case and set up for operation	——
Frame aperture on screen	——	Frame aperature on screen	——
Recognize sound film	——	Insert slides properly	——
Recognize if film needs rewinding	——	Focus for slides	——
		Change to opaque proj.	——

Thread film for sound proj. ——
Operate by hand for several frames ——
Focus properly ——
Frame picture on screen ——
Stop for single frame proj. ——
Control sound quality ——
Rewind machine ——
Rewind film ——
Clean lenses ——
Clean film gate ——
Oil machine ——
Replace projector bulb ——
Replace exciter lamp ——
Replace belts ——
Replace machine and speaker for return to storage ——

Silent Projector

Remove from case and set up for operation ——
Frame aperture on screen ——
Recognize film ——
Recognize if film needs rewinding ——
Thread film properly ——
Operate by hand for several frames ——
Focus properly ——
Start and stop properly ——
Frame picture on screen ——
Stop for single frame proj. ——
Reverse machine ——
Rewind film ——
Clean lenses ——
Clean film gate ——
Replace projector bulb ——
Replace in case ——

Focus of opaque proj. ——
Change bulb ——
Clean lenses ——

$3\frac{1}{4} \times 4$ *Slide Projector*

Remove from case and set up for operation ——
Frame aperture on screen ——
Insert slides properly ——
Focus properly ——
Clean lenses ——
Replace bulb ——

2×2 *Slide and Strip Film Projector*

Remove from case and set up for operation ——
Frame aperture on screen ——
Insert slides and/or strip film ——
Change bulb ——
Clean lenses ——

Screens

Determine correct distance for screen from proj. ——
Set up properly ——
Darken room as needed ——
Fold up properly ——
Gen. care of screens ——

Chapter 29

SOUND, RECORDING AND AMPLIFICATION

GILBERT M. GALLOWAY[1]

NATURE OF SOUND

WE are surrounded most of our lives by an abundant amount of sound. Some of this sound may fall under the category of noise—some into talk, small talk or friendly conversation or the golden tones of an orator—this last sounds sometimes less golden and more laden. Sometimes we hear the sound of a beautiful note on a violin or the ethereal almost intangible sound of a flute somewhere in the Indian night, and our heart aches to catch and hold this beauty. We are quite surrounded by these sounds—true silence might even be a bit frightening to us. A Bell Telephone Company engineer pointed out: "The utter silence (of a totally sound proof research room) is oppressive to some, frightening to others. Visitors are often startled to hear their hearts beating and clothes stretching as they breathe."[2] Most of us are not concerned with a sound-proof room, except perhaps when talk and noise, as the old adage says, becomes too cheap. And cheap though it may be those who are interested in recording, reproduction and amplification find that there are many expensive gadgets to capture the very beauty and mood of the flute notes. Accurate electronic instruments are costly. Again looking at the Bell Telephone System in the United States we find that talk is certainly not cheap in their work. "To handle television transmission and to serve the millions of telephones—half of them added in the last decade—the Bell System has undergone since the war the biggest expansion of any corporation in the history of this country. Expenditure for new telephone facilities alone amounted to nine million dollars."[3] The wildest dreams of these men (and perhaps they are not so wild) of the Telephone Company

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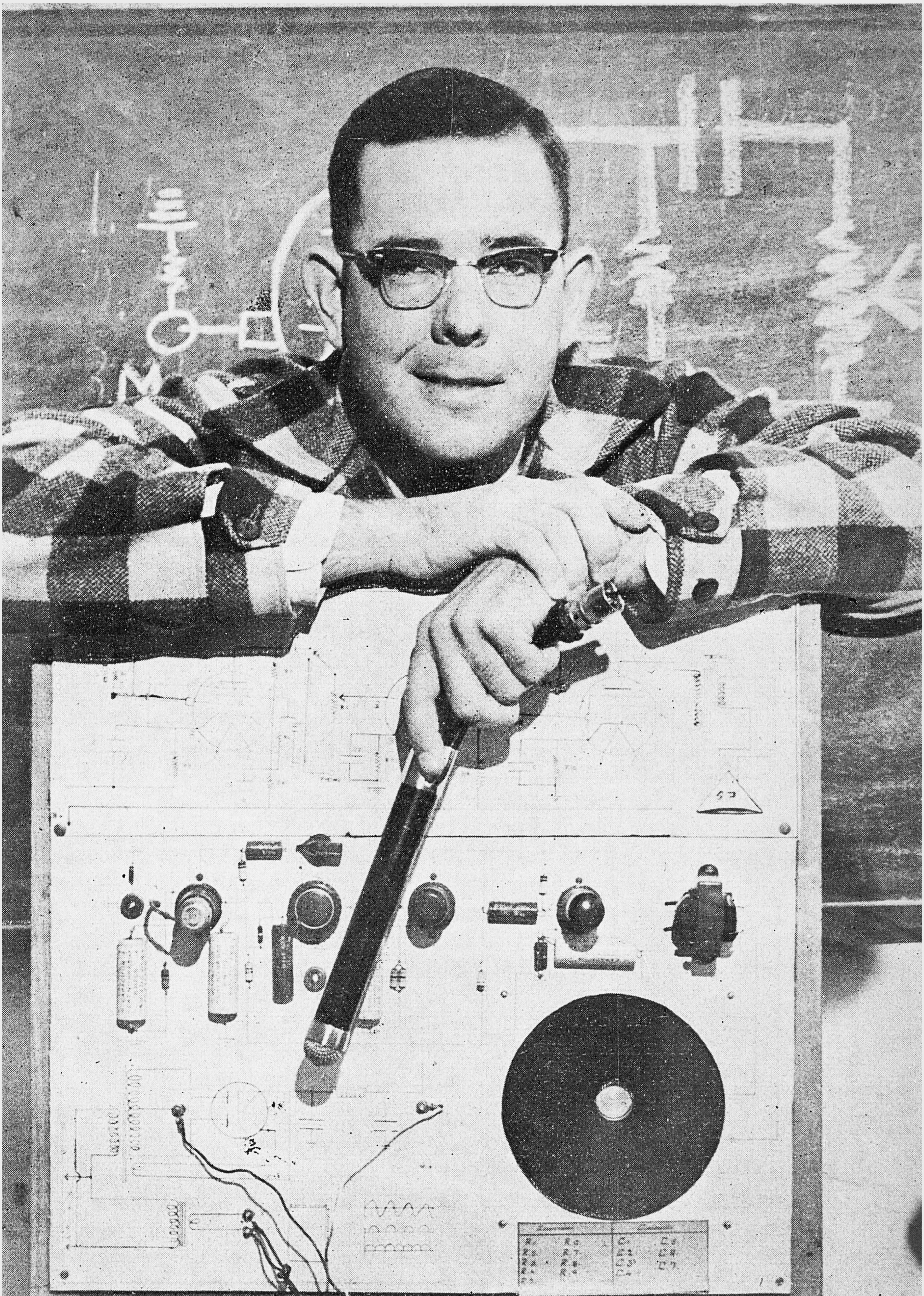
[2] National Geographic Magazine, July 1954. No. I, Vol. CVI, page 106.

[3] National Geographic Magazine, July 1954. No. I, Vol. CVI, page 88.

who deal with sound are that in the future every person in the world will have a gadget strapped on his wrist about the size of our present watches and with it he can both see and talk to any other person in the world. Such is the monstrous proportion that this business of sound takes on. Our mission is not quite so grandiose as that of the Bell Telephone Company; we want mainly to be able to amplify our voice, record speech and music and then play our recordings or commercial recordings back to audiences wherever those audiences may be. If there is anything ambitious in our scheme it is this last—wherever those audiences may be—because this entails the use of powerful yet manageable, lightweight, portable equipment, but we get ahead of ourselves. First, let us deal with some of the most fundamental aspects of our problem. Sound and the old question of whether a tree makes any noise when it falls in a deserted jungle can be reduced to more or less simple vibrations and these vibrations can be illustrated and analyzed through mathematics.

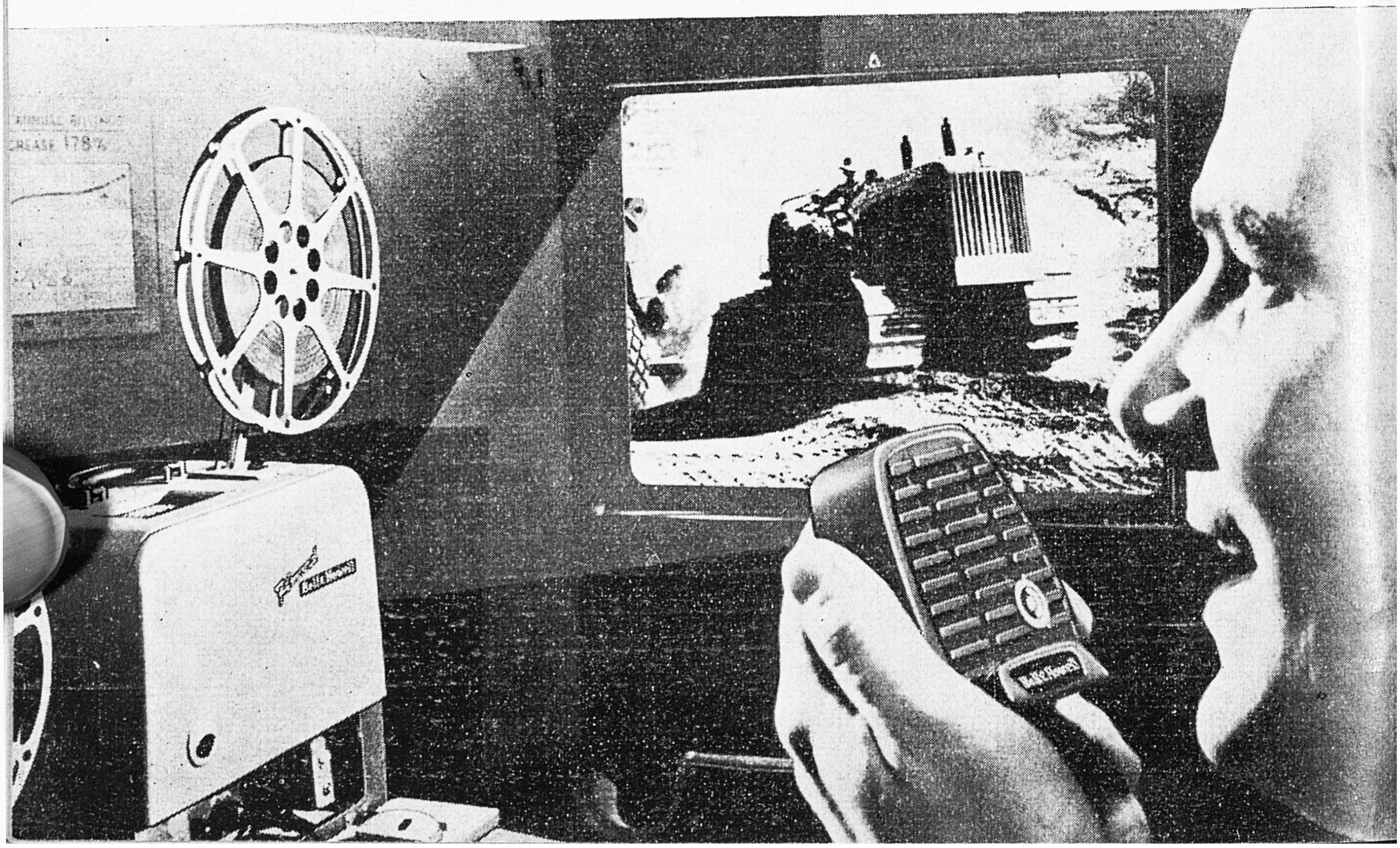
When you pluck a *sitar* string it goes back and forth very fast and its very movement makes the sound that we hear, likewise the sound of the high-pitched flute is a column of air vibrating very fast and the deep notes of the *tabla* (drum) are produced by very slow vibrations. Thomas Alva Edison, an American scientist, first harnessed these vibrations by attaching a sharp needle to a diaphragm which vibrated when he spoke into it and then the result of the movements of the needle were etched onto a metallic foil which was wrapped around a cylinder. When the needle was caused to retrace the groove that it had made in the foil it again caused the diaphragm to vibrate and the diaphragm emitted the same sounds that Edison's vocal cords had produced, i.e., "Mary had a Little Lamb" The simplicity and success of this talking machine that Edison made on his very first trial so amazed him that he held this little creation almost in awe. That first groove that he etched on the metallic foil recording cylinder has indeed grown from the foot or so of its original length to a tiny wavy line that would indeed reach the moon, yea the stars, if the spirals of all the recordings made in duplicate of this principle were straightened out and laid end to end. In a modern microgroove 33 1/3 r.p.m. recording there is almost a mile of grooves in each record.

For a long time the only way to reproduce a cylindrical or disc recording was by purely mechanical means as witness the many old Victor Talking machines that still grace mission bungalows, and indeed in their newer more streamlined form are often put to good use in the villages playing records where there is no electricity. But the electronic age has come and now most of the high quality reproducers operate with an electronic amplifier, and so with the reporting here of the invention of the electronic amplifier we shall leave our musings about ethereal flute notes and go into what we



Mr. Gilbert Galloway, Engineering Consultant to the Radio Commission, begins his course on Sound, Recordings and Amplification at the Training Course, Jabalpur.

You can add sound to your 8 mm., 9.5 mm. or 16 mm. films by using a magnetic sound projector. Film must be coated with a magnetic oxide stripe.



hope will be a practical discussion of this prime mover of modern recording and amplification, the electronic amplifier.

AMPLIFIERS—WHAT THEY ARE

A basic amplifier is a very simple machine [which, by the way, I think can generally be trusted to the average bazaar radio man, amplifiers being his *"khas kam"* (chief work) as witness the many he mounts on rickshaws, tongas or anywhere else a loud noise is needed]. The average electronic amplifier that we are interested in has generally 3 valves (tubes). One of these valves is used to change the electricity coming from the mains (or from the vibrator supply if the amplifier is operated from a battery) into what we call D.C. electricity at high voltage which is suitable for the rest of the amplifier. This valve is called a rectifier. The other two valves, found in most medium power amplifiers, are the ones that do the actual amplification. These valves as the English name implies are just that, valves that are opened and closed by very small effort and let pass through very great amounts of energy. This energy is then fed into a speaker and causes it to vibrate. If the valves turn on and shut off this flow of electrical energy very rapidly, i.e., at the same frequency that a flute note vibrates we indeed have that same flute note coming from the speaker except this time with very much more power than the delicate tones we have heard from the strolling player in the night. The three valves that we have just outlined are enough to operate from most phonograph pickups. If we want to operate from a microphone or from some of the newer low energy, high quality phonograph pickups, then we have to add another valve so as to have enough amplification. Of course, there are all sorts of variation of this scheme but this, with as few as three or four valves comprises the circuit that we find in much of our equipment.

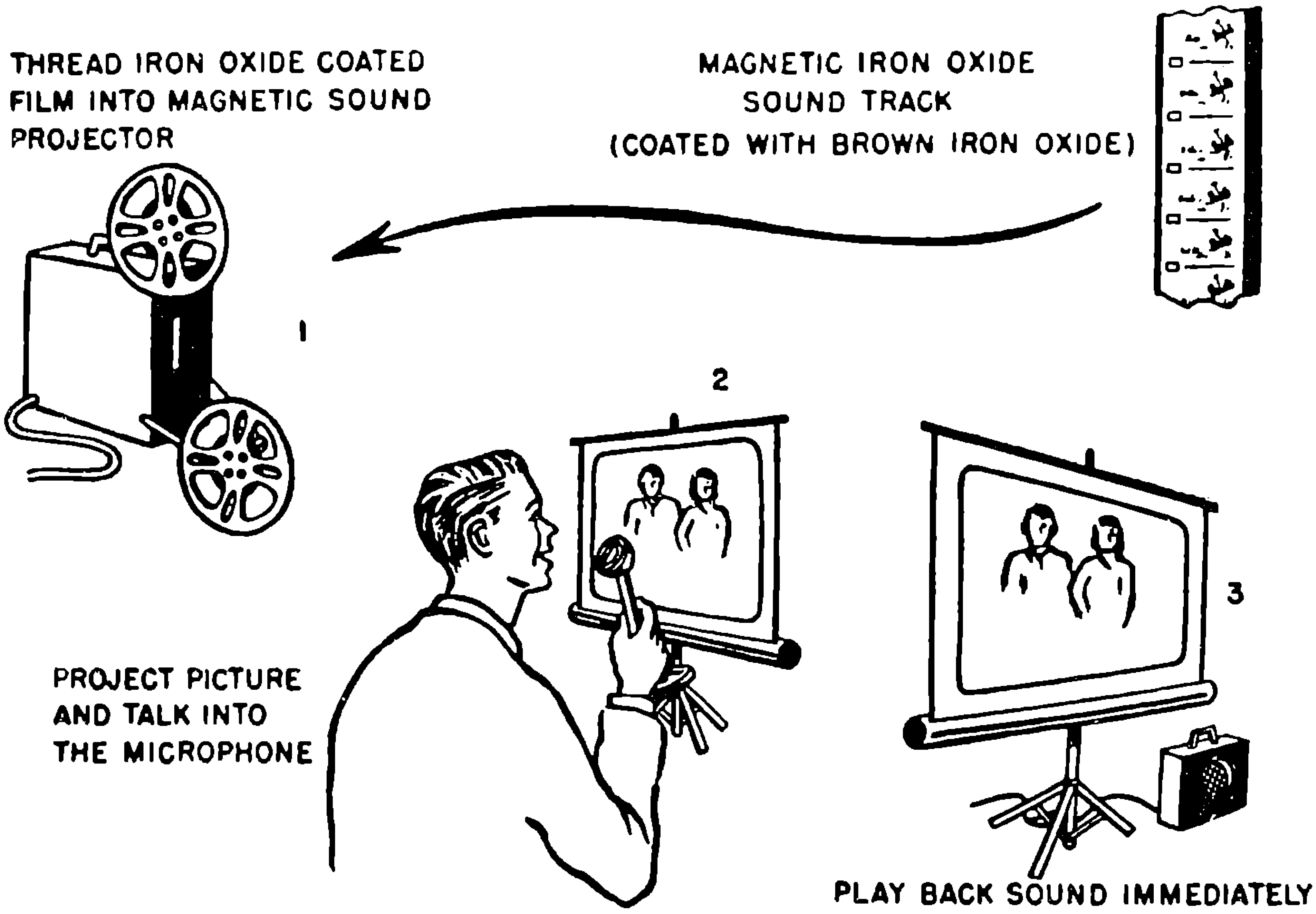
AMPLIFIERS—THEIR USES

As we have already intimated if we connect a microphone to the amplifier we can use it as a P.A. (public address) system. If we hook a photo-electric cell onto the amplifier then we can use it to read the sound tracks of our films and thus have talking movies. One of the latest and very important applications for us is this—if he hook a magnetic head onto our amplifier then it will play back magnetic recordings that we ourselves can make both on specially prepared movie film and on tape, and of course, we can use our amplifiers for these operations one at a time or conceivably one amplifier can be used for all these different operations at the same time. Although the example is before us almost every day in the bazaar with the

noisy recordings or loud harangues coming from a rickshaw or a tonga, quite often our equipment is not equally portable and we are limited to the vicinity of an electric outlet. With the addition of a vibrator power supply which is available in the stores of many of the radio-repair men in this country we can convert our existing amplifiers into portable units. The vibrator supply hooks onto a 6-volt battery that we might have in our car or to a battery entirely separate from a car and thus wherever we have the strength to carry the battery we can use the amplifier. Of course, the microphone can be attached directly to the amplifier for battery operation and presents no difficulties except perhaps for those annoying howls and yells known technically as *feedback.* Let's digress a moment and take up this problem of feedback—the first step in solving it is in the purchase of the microphone. A microphone that is said to be "highly directional" should be bought. By this it is meant that the microphone picks up sound from only one direction and thus when it is turned away from the loudspeaker such a microphone will not produce feedback so badly. The other recommendation is that the speakers be placed as far away from the microphone as is possible. If the existing speaker wires are short almost any sort of wire may be substituted for extra length. A small, cheap, yet sturdy plastic covered twisted extension cord available in most bazaars is excellent for this use. If after these precautions the amplifier persists in howling you will just have to suffer yourself to turn down the volume. Now continuing our list of "practical" uses there is this one of playing records using our portable amplifier and battery. Now, how shall we make the record go round? About the easiest way to do this is to take one of the older mechanical record players already available in many stations and purchase for it, an approximately Rs. 18 attachment which is an electrical pickup head. It slips on and plays in place of the old mechanical sound head. The wires from it are attached to the phonograph input on the amplifier. This is a rather economical and fool proof way for playing recordings with portable equipment and, by the way, if you do not have an amplifier at present and are interested in purchasing one—fairly cheap amplifiers (i.e., under Rs. 200) are available. They are manufactured in India. The beauty of this is that replacement valves and parts are readily available for these amplifiers. Also these amplifiers constructed here in India are made so that they can be connected to house current or to the battery without any extra outside attachments and they are very compact. Any of the N.C.C. A-VA Secretaries can direct you to reliable dealers. We have now covered the most common uses of amplifiers and specific ways of using them as portable equipment, now let us go into some of their very newest uses that may find wide application here in India.

MAGNETIC PROJECTOR

As mentioned before, a photo-electric cell can be hooked to a basic amplifier and thus it reproduces the sound for talking movies. These optical sound tracks are quite beyond our ordinary means to record nowadays, but the newer application of attaching a magnetic reproducer to an amplifier has been ingeniously incorporated into movie projectors in this way: any film can now be taken whether it is one shot by an amateur or whether it is a professional production complete with sound track—then a thin strip of magnetic recording



MAKING SCHOOL MAGNETIC SOUND FILMS

material can be coated on its edge so as not to disturb the picture or the original optical sound track and finally a recording can be made on this strip of iron oxide even by amateurs and in any language desired. Just at present films are being coated in America for a few cents a foot; however, as this handbook goes to press, there are no such facilities in India—there probably will be soon. Already we have equipment in India to record and play back such films and some coated films are available here for experimentation.

TAPE RECORDERS

This now brings us (and perhaps we should have come here first) to a rather widely used new comer as regards specialized amplifiers, i.e., the tape recorder. In the section above we were simply considering a tape recorder attached to an ordinary movie projector.

Now let's look at the tape recorder itself. The principle basically is still the same—vibrations being inscribed in a recording substance. However, this time the vibrations are transformed into magnetic vibrations and the recording medium is a long plastic or paper tape with iron oxide coated on it. This time the vibrations magnetize the iron on the tape and so we have recorded patterns of magnetism rather than patterns of wiggles in a groove as on a phonograph disc. Now that we know how it operates, we can imagine that its uses for us are almost limitless. Language, study, teaching aid in the class room, speech correction, pure entertainment, sending personal vocal messages to far-flung points around the world and the less glamorous use although similar to that of the sound movie outlined above is a tape recording to accompany filmstrips. Anyone interested in tape recording and who has a recorder no doubt has found numerous uses for it; however, this method of using it to supply a sound track for filmstrip perhaps bears further notice.

SOUND FILMSTRIPS

They say that a picture is worth a thousand words and further, with our experience with 16 mm. sound motion pictures, we know that a moving picture, indeed, one that talks is invaluable in its teaching work. As stated above, although less glamorous, yet very effective is the idea of supplying a sound recording for filmstrips. Black and white filmstrips are sometimes rather dull, yet they are usually better than just straight talk. Sound added to them will increase their value immensely and sound added to color filmstrips can sometimes approach the average movie in effectiveness. There are a few movies available for filmstrips but they have their drawbacks. *First,* they are on records and the records are at best rather bulky and have to be changed frequently. Some recordings have been made on long playing records and so overcome the frequent interruption resulting from changing. Yet, discus at best involves a costly commercial process for production. (The amateur disc recorder can be used, but the discs are made of soft material and wear out after only a few uses.)

In contrast to all this is the tape recording process which can:

1. Be done by anyone (fortunate enough to own or have accesss to tape recorder).
   Be used over and over again (tapes are practically indestructible unless deliberately cut or damaged).
3. Be recorded in any language and be erased and recorded if there are any mistakes or if there is a desire for change.

One may ask, "Why have a recording for slides? Can't a speaker simply read the script while the strip is being shown"? Of course, but the music and sound effects (which help to give the "professional

touch" to sound movies) can easily be recorded even by an amateur. Music, sound effects, and the assurance that the dialogue will be clear and perfect and in the desired language assure a greatly improved filmstrip presentation. Besides, for a large audience, that is often encountered at a slide showing one does need an amplifier—the tape recording can be turned up as loud as is necessary. Another feature of the tape recorder (since after all, it's just a specialized version of the simple amplifier outlined above) is that it's usually designed to act as a public address system quite independently of its recording work.

So as we have seen, many filmstrips that are now on hand can be increased very much in their interest and teaching value by the addition of sound which most logically can be recorded on magnetic tape. Tape recording studios for the church are being set up at several places in India. Perhaps we can look to them to pioneer in producing sound tracks for filmstrips that can be supplied to those who do not have means to record themselves. But you say, "Even if the tapes are available, how can we play them without the large expense of buying a tape recorder"? There has already appeared on the market a comparatively inexpensive (about Rs. 150) attachment that can be attached to any existing amplifier for playing tapes. One could even play it through a radio in the same way many phonographs are attached to radios. It would seem that there is a great future for such a programme of the production and playing of sound tapes for filmstrips.

Another very appealing use for tape recording for slides is one that many missionaries would be interested in. That is a sound tape much like the ones outlined above for use with slides shown to the churches of their respective countries. Imagine the appeal of not only showing slides of the boys and girls and men and women of a country, but also in unison with the picture hear them talk, sing and play their music together with a suitable commentary. Indeed, such slide series do not need to await furlough time as they can be sent directly home and used as many of the churches nowadays in America and elsewhere have tape recorders available.

Thus we have tried to cover with "practical applications" the use of amplifiers and sound as it is used on the field today and as it gives promise of use in the future. Now some odds and ends about cycles and r.p.m's:

1. Most machines in America are designed for 60 cycle current, while the current in India is 50 cycles. Therefore, American record players and tape recorders run slowly here. Remedy—Increase the size of the main belt drive pully or motor spindle to speed up the tape or record to the standard speed.

2. Recording sent to America on tape made on unadjusted machines run too fast. Remedy—Make sure the recording is done

on a properly adjusted American machine or on a British machine (British machines need no adjustment).

3. Records sent from America to India will, of course, play correctly on an adjusted machine (one that runs at the correct speed); they will play slowly on an unadjusted machine. Remedy—Speed up the machine as mentioned above.

4. STANDARD speeds at this time are for records:

(*a*) 78 revolutions per minute (78 r.p.m.). This is the old "standard" type record that plays about 3 minutes on a 7 inch diameter disc.

(*b*) 45 r.p.m. A small plastic variety that are usually played on a special machine. They have large center holes. (Most modern record players play all three speeds and if one is planning to buy a new machine he should see to it that it does play all three speeds).

(c) The third speed is 33 1/3 r.p.m. The large 12″ diameter disc at this speed will last up to 25 minutes on each side thus giving almost an hour per record. These records with their "high fidelity" characteristics and uninterrupted playing are coming into very wide use these days.

For tape:

(1) 3¼ inches per second. This gives up to two hours recording time on a single tape.[1] Music recorded at this speed will not have a very high quality of sound.

(2) 7½ inches per second. This is the speed normally used for tape recording; it can give up to one hour on a single tape. This speed, recorded on a "single track" should always be used when sending a recording to another place, unless it is definitely known that other conditions can be met.

(3) 15 inches per second. This speed is not usually available in ordinary amateur machines. It is used in special commercial productions where very high quality is desired.

The terms "records", "recordings", and "transcriptions" are used interchangeably, though ordinarily transcriptions are made for broadcast purposes only. We have already noted the developments in the sound and recording field, some of which have special interest for the worker in India. (1) The new technical developments in the field of magnetic tape recording has stimulated the whole "recording"

[1] If the tape recorder is a "double track" machine, e.g., it records on both edges of a single tape; otherwise, a single track machine will give only half the recording time for the speeds given.

field. (2) The development of long-playing (LP) records has led to a limitless supply of music-education and home-enjoyment material that provide uninterrupted listening. Look at any month's copy of the magazine *High Fidelity* to see the wave of new recordings. (3) All-India Radio is increasing the number of school or educational broadcasts. (4) A few publishing houses are just beginning to offer records and films to supplement the reading material. We are standing on the doorway of new advances in the sound and recording field.

MAKE A RECORDING

Suppose you are ready to make a recording in your school—a simple dramatization—of the landing of St. Thomas on the coast of South India. The time: the First Century A.D.

You must practise placing the microphone until you test each voice for the best recording distance for each actor in relation to the mike. Instruct the actors to speak in a clear, distinct manner. Since they are not playing to the hall they should think of the microphone. Before starting the tape recorder check outside noises and eliminate as much background noise as possible. Curtains and draped *sari's* make fair sound barriers. Remember the mike is sensitive and as actor after actor moves up to his 18 inch to 3 foot stance no one should move, jar or shake the mike. There are three types of sound you may want to put on your tape: (1) Voice, (2) Music and (3) sound effects. In the first experiment with "St. Thomas Comes to India", the announcer, narrator and actors carry the "voice" portion of sound picked up by the microphone and recorded on tape. Background music and "bridges" between episodes is very effective. Finally, sounds of the sea, a boat docking, and crowd scene noises can be worked in. As one gains experience with mixing voice, music and sound effects a radio-type programme can be produced on your tape.

Chapter 30

WHAT IS HIGH FIDELITY?

DONALD F. EBRIGHT[1]

WHAT are they talking about? "tweeters", "woofers", "compensators" and "preamplifier equalizers"? What are they doing? A sober faced teacher walks into a showroom, puts on a recording of Beethoven's "Emperor" Concerto with Horowitz at the Steinway and then drops on his hands and knees in front of a large phonograph speaker. No one stares or is disturbed. It's quite normal today. Our teacher is one of the millions of British and Americans who are known as "high fidelity bugs" The typical Hi-Fi fan is one who takes his musical listening seriously and wants to be sure his speaker is producing the pure deep bass and the clear high treble necessary for live music. The goal of the Hi-Fi enthusiast is to produce music in his home as though the orchestra or choir was there. So underneath the "tweeter-woofer" vocabulary there is evidence of a marked development in music appreciation and a desire to have life-like music in school and home.

Music listeners have long wanted full-range music but for years they were rewarded with half-a-musical-loaf because manufacturers produced inadequate assembled equipment. But, first, does this have any scientific objective basis?

Hi-Fi simply means faithfulness to the original performance whether it comes to you on a radio, record or tape recording. People missed something on the early radios and phonographs. To understand this you must remember what a note is. When you stretch a rubber band and pluck it in the middle, the vibrations produce a sound. The faster the vibration (the higher the frequency), the higher the note you hear; the slower the vibrations, the lower the note. For example, Mr. S. B. Tewarson plucks his *sitar* and the strings vibrate 200 times per second (cycles per second, cps). Out in the kitchen Mrs. Tewarson is watching the teakettle. The whistling teakettle may produce the same note but it does not sound the same.

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[1] Rev. Donald F. Ebright, B.A., B.D., M.A., Ph.D., D.D., 37, Cantonment Road, Lucknow, U.P., is loaned by the Methodist Church in Southern Asia to be the Secretary of the Audio-Visual Aids Committee of the National Christian Council of India.

Why? It's because the *sitar* strings produce not only the basic note (fundamental) that you hear from the teakettle. It also produces numerous higher pitched overtones (harmonics), 400 cps, 600 cps, etc., which blend with the fundamental and produce the color or richness in music. Therefore, the more overtones the richer the music.

The ordinary radio or phonograph cannot bring you overtones higher than 5,000 cps—but the human ear can hear up to 15,000 cps. That is why a trumpet loses its sharp clarity when heard through ordinary radios or phonographs, i.e., the phonograph isn't giving you all your ear can take.

Likewise you miss the deep tones of the pipe organ. Your ear can hear tones as low as 20 cps—but the ordinary phonograph doesn't transmit below 150 cps.

But with high-fidelity equipment you get the full tonal range, from 16 to 20,000 cps, and the orchestra sounds as if it were right in the living room. That is why the music is "life-like'. The main characteristic is that each instrument stands out clearly and strongly. Eugene Ormandy, conductor of the Philadelphia Orchestra, says that high-fidelity "represents the most important contribution to music within recent time."

What do you need to transport music to your school hall, church auditorium or living room? A turntable or record changer, an amplifier, a phono pickup and a speaker. This outfit can be procured for as little as Rs. 450 or ten times that amount. Your ear and pocketbook have the determining vote. The truth is that the lowest priced Hi-Fi components give you a performance far better than anything to be heard in the pre-Hi-Fi era.

Once you have your set you can change parts (components) and by adding more expensive parts through the years ultimately possess "the best" Today people are discussing "tweeters" (small speaker for reproduction of the high notes", "woofers" (large speakers producing the lows), "whiskers" (fuzzy high notes) and "wows" (wavering tones resulting from an uneven revolving turntable) and yearly improving the music they listen to.

How old is true Hi-Fi? For twenty years major companies have been experimenting but it is only since 1950 that quantity-production of quality-components have reached the public market. The best hi-fi sets are handmade. That is an RCA, Stromberg-Carlson, Philco, Zenith, Crosley or Webcor ready-made "record changer" is made for mass production, has a limited cycle range and is not "high fidelity" Consequently, today's music lover goes shopping for the parts he can afford and which produce an awe-inspiring "closeness" to the orchestra—just as if you were next to the Conductor and assembles them himself.

If you are ready to launch forth and build a Hi-Fi set and

bring the London Symphony into Jhansi, U.P., India, these are good introductory books. Read *High Fidelity Simplified,* Harrison D. Weiler (Rider: $2.50); *Home Music Systems,* Edward T. Canby (Harper: $3.95); *Saturday Review Home Book of Recorded Music,* by Canby, Burke and Kolodin (Prentice-Hall: $4.50); and for the best magazine the Editor of "A-V News" has located, *High Fidelity Magazine,* printed in Great Barrington, Massachussets.

If you have decided to acquire a high-fidelity music system, the first problem is to select the component parts which go to make up the system. Nearly everyone will want phonograph record playing facilities and this should be the first consideration in selecting components for the Basic System.

FIRST THINGS FIRST!

The selection of the components for the basic phonograph may look like a complicated and confusing proposition to the music lover without technical background, but this need not be so if the selection proceeds in an orderly manner following the steps outlined later. There are certain basic facts which need recognition first of all, and these are briefly covered to eliminate much of the mystery and misunderstanding which is found in High Fidelity. It should be possible for anyone to select the components for a highly satisfactory system from this catalog with the aid of the practical pointers which are given here.

THE LIST OF COMPONENTS

The Basic Phonograph requires record-playing facilities, an amplifier, a loudspeaker and a loudspeaker cabinet.

There is a choice to be exercised as to whether (1) a record changer or (2) a turntable (no automatic changing of records) will be used. The record changer is convenient and generally the least expensive; many experts feel that a good turntable gives superior reproduction because of greater freedom from wavering pitch, "wow" and rumble; but the cost is higher than that of a record changer.

The record changer will need pickup cartridges, one for larger groove (78 r.p.m.) records and one for fine-groove (33 1/3 and 45 r.p.m.). Or you may want a combination or "turnover" cartridge which will play both. The turntable will require the purchase of a separate tonearm and the necessary cartridges.

First decide about how much you wish to spend for the basic phonograph. Neglecting cabinet work (which can be eliminated if equipment is mounted on bookshelves) but including speaker cabinet, the minimum cost for a basic phonograph with legitimate claims to high-fidelity performance is just about $150 at current prices. Performance is good, but a discriminating listener would

want to improve it. At around $250 we attain the quality of reproduction demanded by those who know their way around in high-fidelity. $400 to $450 will provide superior high-fidelity results.

The loudspeaker, when used with well-chosen record playing facilities and amplifier, has the key role in the high-fidelity system. No system can possibly be better than the loudspeaker. No portion of the system is as capable of introducing blatant or subtle distortions or colorations of the music. On the other hand, no choice is more rewarding in musical enjoyment than a well-chosen loudspeaker. The cabinet must be included in considering the speaker problem, because the bass reproduction from the speaker is affected by the choice of cabinet.

The minimum system (approximately $150 with record changer) can be appropriately and effectively equipped with a 12-inch coaxial speaker and an inexpensive bass reflex cabinet for just under $60. Considerably more can be paid for the speaker and cabinet in some makes with results which are substantially less listenable.

In the next bracket (about $250 or $350 with turntable) an excellent choice would be a 12-inch coaxial with compression driver hornloaded high-frequency unit (integral part of the speaker), in a backloading folded horn cabinet, totalling a little over $110.

For a still better system ($400 to $450 with changer or $500 to $550 with turntable), outstanding results are obtainable with a 15-minute coaxial with compression driver horn loaded h-f unit (integral part of the speaker) in a back loading folded horn cabinet; this will cost about $210. The next decision is whether a record changer or a turntable is to be used.

The record changer is the popular choice. It is the least expensive and is complete with arm which bears the pickup cartridge. It is preferred by many for family use because the automatic set-down of the arm tends to protect both stylus and record against the damage which may be caused by careless handling of a manual arm. The record changing feature speaks for itself. It will pay to buy a high quality record changer, if that is to be your choice.

The best changers exhibit to a lesser degree the shortcoming of uneveness of speed which shows up as a "wow" or wavering of pitch especially noticeable on piano and sustained notes. You will want a 3-speed type and catalog descriptions should be read carefully to insure that the changer will accommodate the pickup cartridge which you decide to use.

The turntable and arm combination is the choice of many experts because of the extreme constancy of speed. A more technically flawless reproduction of disk music can be obtained by this method than with a record changer. High grade units have extremely low "rumble" noise, Since the separate tonearm does not have to be

compromised as in the arm of a record changer, it can be designed to handle more perfectly the function of supporting the pickup cartridge in an acoustically correct manner as it passes across the record.

Choices of turntables are few in the really good category. Probably nothing less than the "deluxe" type will deliver the performance which will justify use of this method. As to the separate pickup arm which must be independently chosen, there are a number available of known technical excellence. Here again, check the product description to insure that the arm is well adapted to the pickup cartridge of your choice.

The pickup cartridge has the very important function of translating the music mechanically inscribed in the record grooves into corresponding electrical variations which are strengthened by the amplifier to a sufficient power to operate the loudspeaker. Coupling the cartridge to the groove is a precisely shaped stylus; to resist wear, the stylus tip is made of sapphire or diamond. The sapphire is the least expensive and the least hard, showing definite signs of wear in as little as 5 hours of playing and prohibitive wear at 50 hours. The diamond stylus on the other hand lasts about 100 times as long, and costs about 6 times as much as the sapphire. The higher first cost of the diamond is an excellent investment, for one will spend about 16 times as much for sapphire replacements as for diamond over a period of time.

For fine groove records, the stylus tip is rounded to a radius of .001″; for large groove (78 r.p.m.) a radius of either .0025″ or .0027″ is a satisfactory value.

The problem of supplying the correct stylus to the record which calls for its use is accomplished in one of two ways; (*a*) The use of two complete cartridges with different styli which are plugged into the arm as required, or (*b*) a combination cartridge which may be turned over to present the other stylus to the record. The latter method is more convenient, but many experts consider that they get better results by using separate cartridges.

Amplifiers cover a wide price range. It has been pointed out by music critics the difference between relative inexpensive and relative expensive amplifiers is audibly very little indeed. There certainly is far and away less audible difference between amplifiers than between loudspeakers. An inexpensive amplifier is a far safer purchase than an inadequate speaker. However, there are advantages in flexibility and in other features in the more costly amplifiers. But if a compromise must be made it can be done here without doing violence to the general system quality. It is reasonable to use an inexpensive amplifier in connection with a low budget high fidelity system. It is likewise satisfactory to retain such an amplifier for the time being when making system improvements, giving higher priority

to items with more evident audible dividends such as loudspeakers and enclosure.

The more costly amplifiers have more flexible "controls" which can more precisely adapt the system to the widely varying requirements of the records of the past and those of the present from different record makers. Sometimes these controls are in a separate unit which may be conveniently located near the easy-chair while the main unit is elsewhere out of the way.

From an acoustical point of view, a ten-watt amplifier will provide a greater volume of sound (when turned to high volume) than can be tolerated in the average home. For normal listening, less than a watt will be supplied by the amplifier. It is sound practice to buy an amplifier of not less than 10-watt rating, however.

An important point in selecting an amplifier is to make certain that it is designed to accommodate a magnetic pickup.

Before you go much farther you will encounter technical terms and definitions. What are some basic Hi-Fi terms?

Two-Way System: Applies to a loudspeaker in which low and high frequencies are separately reproduced by two electrically independent speaker elements, each provided with a suitable sound radiating system.

Three-Way System: Applies to a loudspeaker in which the low, middle and high frequencies are separately reproduced by three electrically independent speaker elements with suitable sound radiating systems.

Coaxial Loudspeaker: In technically accepted usage, a two-way system unitary assembly in which the high frequency unit is mounted approximately on the axis of the low frequency unit. The term "Coaxial" has recently been used to describe a speaker with a single electrical driving system and a compound direct radiator system, a part of which tends to augment the high frequency range in a limited frequency region. Such speakers can be differentiated from true coaxials because the direct radiators are driven by a single common voice coil. The more expensive true coaxial speakers employ a horn-loaded compression-driver high-frequency unit instead of a direct radiator unit.

Divided System: A multiple channel system in which the loudspeaker elements are distinct and separated (rather than being combined as in coaxial and triaxial types.

Compression Driver Unit: A loudspeaker driver unit which does not radiate directly from the vibrating surface, but which requires acoustic loading from a horn which connects through a small throat to an air space adjacent to the diaphragm.

Horn Loading: The coupling of a loudspeaker diaphragm to the listening space by means of an expanding air column with a relatively small throat and a relatively large mouth.

"Woofer" (Low frequency unit): The loudspeaker unit reproduc-

ing the lowest frequencies in a two-way or three-way system. In current practice, the "woofer" is a direct radiator type (cone) speaker, which however has its low frequency performance augmented by a bass reflex or horn loading enclosure.

Low-Frequency Unit: See "Woofer"

"Tweeter": The name given to the high frequency unit (speaker) in a two-way system, and to the mid-frequency unit and high frequency unit in a three-way system. Sometimes the term "super-tweeter" is applied to speaker handling highest frequencies in a three-way system.

High-Frequency Unit: See "Tweeter" Generally applied to all units except low frequency unit ("Woofer") in two- or three-way system.

Bass Reflex: A loudspeaker cabinet or enclosure in which a part or opening is provided, so proportioned to the interior volume of the cabinet and the speaker characteristics that the port acts acoustically as an auxiliary speaker at low frequencies, thus augmenting the bass reproduction and reducing distortion common to non-ported total enclosures.

Back Loading: A form of horn loading, particularly applicable to low frequency speakers, in which the rear radiating surface of the speaker feeds the horn, while the front part of the speaker is directly exposed to the room. An ideal method of providing low frequency loading for a coaxial or triaxial speaker in which the speaker front must be unobstructedly exposed to prevent loss of high-frequencies.

Folded Horn: A method of constructing a horn with long length in small space so as to avoid undue bulk in the cabinet.

Triaxial Loudspeaker: A three-way system in which the three speaker elements are combined into one unitary assembly.

Amplifier: The electronic device which increases the minute electrical impulses from the phonograph pickup (or FM-AM tuner or TV chassis) to sufficient power output to operate the loudspeaker system to the desired maximum volume level. (Note: amplifiers offered for high fidelity home music applications have a volume control, treble control and speaker impedance. Additional features that may or may not be provided are: adjustments for easy adaptation of bass and treble to match the recording characteristics of various American and European records (independent or individual "preference" controls of bass and treble); "remote" mounting of controls so they may be placed within more easy access to the listening position; noise suppressor, an electronic system for reducing the audible objectionableness of record scratch and hiss. Amplifiers vary in "gain", that is the relative weakness of the signal which will provide the full-rated power output; some will work only from crystal phono pickup and tuner (FM-AM or TV chassis) while others will accommodate the weaker output of a magnetic pickup (of which the variable reluctance type is one) as well as the stronger signals from tuner, etc. For home use, from the standpoint of the loudspeaker,

a rated maximum power output of 10 watts is sufficient though many excellent amplifiers offering additional features in the way of controls, special circuits for low distortion, etc., are offered only in higher output power ratings.

Record Changer: A device which will automatically play a number of phonograph records successively. To play all current types of records, the turntable of the changer will need to provide for 33 1/3, 45 and 78 r.p.m. speeds. The automatically operated tone-arm of the changer handling all record speeds will need to be equipped with either a universal type pickup cartridge (adaptable to the different stylus requirements of the fine-groove (33 1/3 and 45 r.p.m.) and large-groove (78 r.p.m.) records, or interchangeable cartridges.

Turntable: A motor driven device for revolving the record at the required speed. As distinguished from the turntable of the record changer, the deluxe turntable is capable of a precise average speed with such small instantaneous deviations from this desired speed that there is no perceptible wavering in pitch or "wow". This type of turntable is also capable of extremely low "rumble" noise arising from vibration of the motor and mechanism. A separate tonearm (pickup arm or "arm") is required for the pickup cartridges.

Pickup Cartridge: The device, which when mounted in a tone-arm to support it against the record in an acoustically correct manner, translates the mechanically inscribed variations in the record groove into coresponding electrical variations which go to the amplifier for amplification and thence to the loudspeaker for ultimate reproduction in the form of music for your listening. (Note: pickups have undergone great developmental improvements in recent years. It is now a far cry from the needle (see "stylus") formerly used in acoustical phonographs to the modern pickup with its integral stylus which is marvellously adapted to the task of tracing the intricate geometrical pattern in the record groove. This stylus motion acts as a tiny generator of electrical impulses which require further amplification to produce sound. The generator may work on either of two principles: (1) piezo-electric or crystal, or (2) magnetic. Of the two the magnetic principle is the one most used today, and the "variable reluctance" type is the most popular magnetic pickup. Though compromise designs have been developed, the same stylus will not serve in high fidelity for both fine-groove (33 1/3 and 45 r.p.m.) and large-groove (78 r.p.m.) records. This means that the pickup cartridge needs to be equipped with two styli, or two cartridges, each with the correct stylus, must be provided in order to play all types of records. Since the electrical impulses from the magnetic pickup are so "weak" extra amplifications or gain must be provided to handle them. Many modern amplifiers have the "preamplifier" built-in; some amplifiers have only sufficient gain to operate from a crystal pickup and a

separate additional preamplifier is needed to work with a magnetic pickup.

Large Groove: Refers to the groove size used for the older original 78 r.p.m. records. The stylus point must have a radius of .0025" to .0027" approximately to fit the groove properly.

Fine Groove: Refers to the groove size used in the "microgroove", "L-P" and other long playing type records with playing speed of 33 1/3 or 45 r.p.m. A pickup stylus radius of .001" is required for records of both speeds. Not only must the stylus fit the record, but the entire pickup system must present light weight and relative ease of lateral motion of the stylus if high quality reproduction is to be obtained and record wear kept to a minimum. Specially designed pickup cartridges and arms incorporate these features.

Turnover Cartridge ("Universal" type): A pickup cartridge, adapted by the use of two styli, to the playing of both large-groove and fine-groove records. The turnover type actually is revolved a half-turn in the arm to present the other stylus. There are of course other possible ways of adapting the pickup system to the playing of both types of records.

Tonearm (arm or pickup arm): The arm which supports the pickup cartridge. An integral part of a record changer, but must be selected separately when a plain turntable mechanism is employed. The functions of the arm are: (1) to allow the pickup to move freely across the record, guided by the record groove only, and maintaining "tracking" or tangency to the groove; (2) to provide sufficient lateral inertia to the pickup, yet allowing for the almost inevitable eccentricity of the center hole of the record; (3) to provide the proper needle pressure to keep the stylus in the groove, yet permit the arm to accommodate an "unflat" record without undue noise or record damage; (4) to accomplish these things without introducing arm vibrations or "jerkiness" of motion in bearings or pivots. The arms best meeting all of the above requirements are usually separate devices specially designed for the purpose. A working compromise is achieved in the arm of the best record changers which must take into account conflicting factors due to the need for automatic control of the arm in the record changing cycle.

Stylus: The portion of the pickup cartridge which rests in the groove of the record. Its function is to drive the mechanism of the pickup as a generator, producing electrical impulses corresponding accurately to the inscribed variations in the record groove. To accomplish this, the stylus point must accurately fit the groove and must maintain this fit throughout the useful life of the stylus. Different size stylus tips are required for large-groove and fine-groove records. The music lover interested in high fidelity reproduction and kindness to his records will recognize the importance of "permanence" in the stylus of the pickup. The pickup cartridges

which best qualify are either sapphire or diamond tipped. Of these, the diamond is far and away the more economical because, resisting wear far longer, it will require very infrequent replacement.

Impedance: In nontechnical terms, the impedance of a loudspeaker is stated in ohms and the value for any particular loudspeaker indicates the amplifier output terminals which should be selected for connection to that particular speaker. Common values of speaker impedance are: 3-4 ohms (sometimes 3.2 ohms); 6-8 ohms; and 16 ohms. A speaker with an impedance of 3-4 ohms is connected to the 4-ohm output of the amplifier, a speaker of 6-8 ohms to the 8-ohm output, and one of 16 ohms to the 16-ohm amplifier output terminals. Most amplifiers are equipped with all of the above output impedance connections and it is only necessary to select the proper terminals for the speaker involved. If the amplifier should have available only output impedances which differ considerably from that of the speaker, it will be desirable to use an impedance-adjusting transformer between the speaker and amplifier; normally this will not be necessary with most amplifiers currently available. If more than one speaker is to be connected to the amplifier, consult your high fidelity supplier or the speaker manufacturer for the proper connections to use for amplifier operational compatibility and to make sure that appropriate power is allocated to the various loudspeakers.

Power Rating: In an amplifier, this is the maximum power which the amplifier will deliver without exceeding a specified distortion of the electrical impulses passing through it. In a loudspeaker, the power rating indicates the amount of power which the speaker is capable of converting into sound without objectionable distortion or damage to the speaker. Amplifiers for high fidelity use are available in rating ranging from 10 to 40 watts; the amount of power actually used depends on the volume (loudness) of reproduction and is regulated by the setting of the volume control. In the home, the power for normal listening will seldom exceed 1 watt; purchase of an amplifier of not less than 10-watt rating is suggested, however, to insure that it will work well within its rated capacity. Loudspeakers of reputable manufacturers which they recommend for high fidelity applications usually have power ratings greatly in excess of even exceptional requirements in home sound reproduction. Therefore the speaker power rating can be disregarded when choosing the loudspeaker for high fidelity use.

Chapter 31

RADIO

P. C. ADDY[1]

QUITE recently I was asked to look through a script prepared for a "feature" item. It was the work of a novice and had all the novice's faults—of omission and commission. Many people who listen in to a good broadcast make the novice's mistake of thinking that its production is a simple affair. For, as about all other "good" things, there is nothing simple about a good broadcast. Like any other worth-while accomplishment, its smoothness, appeal and ease of "going over" are most deceptive, that is, these qualities conceal—as they are meant to—a tremendous amount of hard work and meticulous attention to detail, on the part of the script writer. But there is no reason why anyone who is at all desirous of becoming a competent radio-artist, cannot, with due care and hard-work, develop the skills necessary.

I do not wish to set myself up as an expert on radio-broadcasting. What knowledge I have has come the hard painful way and over a period of eighteen years; and this, both by listening critically to both foreign and home broadcasts, as well as by actual broadcasts and participation in radio-dramas and feature programmes. Nor must one overlook the considerable degree of help one has got from comments of intelligent listeners both friendly and otherwise.

If one is to make any success of radio-broadcasting one must be aware of the severe limitations of the medium, yet within the limits imposed, able to make fullest use of one's opportunity. The limitations arise from the fact that the appeal a broadcast makes is through the ear. All the rich warmth and colour of scenery and setting that appeals to the eye, the play of emotions conveyed by expression and gesture, the magic of "personality" that makes itself felt when the speaker, actor or artist is beheld by his audience—all these are denied the radio-artist. Yet all these may to a large extent be conjured up by the quality of the voice: for the voice by its

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inflexions can set the imagination of the listener so to work that the emotional content of the message remains unimpaired. Rather does this enlisting of the listener's imagination make for a more lasting impression of the message than would have been thought possible, for it has stimulated his own thinking in a very real way.

The Script: its importance: I shall have something to say later about the actual vocal rendering of the script. For the moment I shall deal with the preparation of the script, for that is the foundation of a successful broadcast.

It is obvious that what a script-writer should aim at is to capture and hold the interest of the listener from the start, and win his co-operation by stirring his imagination and his emotions. Sometimes this is best achieved by picturing the listener—not just a vague group or crowd—in his mind's eye, and thereby making his appeal more directly to him as an individual. The poet or artist is often likened to a violinist who, by drawing his bow, evokes music from his instrument. The successful script-writer is no less of an artist, as he too, is out to arouse emotions latent in the listener. He has to remember that he cannot rely on the devices to which the novelist or short-story writer has recourse. The very limitations of his medium compel a certain simplicity of structure which would be out of place on the stage or in a lengthy novel, where the more involved the plot, the more the interest in its gradual or dramatic unravelling. Such intricacy or elaborate detail is definitely out of place in a 15-minute talk, in which the development of the theme should be clear, logical and brief. The mind of a listener cannot be expected to retain too many things: if he is to follow the discourse with interest, it must be presented lucidly and be cut down to the bare essentials. But this enforced brevity also permits a judicious repetition of the key points of the developing theme, so that the listener is never allowed to lose the thread of the argument.

From all that has been said so far, it is clear that the script submitted for my inspection did not satisfy most of these requirements. In addition, the novice-writer had made the common mistake of taking too much for granted in the mind of the listener, so that what was perfectly clear to him in his argument, on account of his own familiarity with the subject, he tacitly presumed would be equally clear to his audience. It might have been to some, but certainly would not have been to all.

One help to avoiding such a pitfall is to "aim" the talk at the

level of an intelligent youth of about 15 or 16, who has some idea about the subject (thereby making unnecessary too many explanations), and at the same time is able to follow the further development of the theme with assurance and appreciation.

One cannot therefore prepare a script without planning it in detail. The treatment of the theme should be balanced, and therefore an outline is essential and should be clear in one's mind before even the first sketch of the talk is put on paper. This preliminary draft must be worked over with great care, and before it is finalised, must be tested out. The simplest way of doing this is by putting oneself in the place of the listener and seeing whether one's interest has been held throughout and whether the argument has been presented with such clarity as makes one satisfied that the speaker has "proved his case" Perhaps if a friend is ready to help, this purpose would be even more easily achieved.

Broadcast of Series: Sometimes a series of talks is planned: in which case the script-writer has to work as carefully as any architect planning a big structure, so that while each talk is complete in itself, it bears definite relation to the whole series. Thus is the listener encouraged to go on with the series, in fact he should want to follow the talks as eagerly as any enthusiast the instalments of a thriller.

A successful talk while presenting the subject with vigour and clarity, cannot attempt exhaustive treatment: the time factor permits only the stressing of just those aspects of a theme as enable the writer without becoming discursive, to make his point. Unless he holds to his point, it cannot be expected that the listener will get it. Even in talks which are largely descriptive of places, events, or people, one has to make a judicious selection of such features as are likely to interest the listener. And only when one is enthusiastic can one make others enthusiastic also.

Treatment of themes: General. A word about the treatment of themes: avoid the abstract, be as concrete and as specific as the nature of the subject allows. Use illustrations that come within the range of a normal person's experience. Aim at simplicity: even in the handling of a scientific or technical subject, it is better to err on the side of over-simplification, than to pretend that the listener is capable of comprehending a complicated train of reasoning made (seemingly) more learned with a liberal use of "jargon". Even if the programme Director of the radio-station allows such a talk to go on the air, the chances are that it will not go far with a listener.

Religious: In dealing with religious subjects, one cannot do better than study afresh the parables of our Lord in the Gospels. Their homely but vivid illustrations, etched with all the skill of a consummate artist, and with an economy of words, "say" far more than many ponderous volumes of theology, and their truth, though profound, is therefore more readily grasped by ordinary people.

Especially must one bear in mind the limitations of the medium of communication. Our Lord never wrote down His teachings, yet they were so clearly impressed on the minds of His hearers that they never forgot His memorable utterances. The script-writer should remember that while a reader can turn back the pages to refresh his mind of some forgotten detail or point made earlier in the argument, the listener has no such advantage. It is therefore necessary to repeat the main points before concluding to ensure that the listener has not missed out anything important. Also, if he is to "carry away" the message, above all, is to be influenced by it in his daily living, besides being enabled to grasp and retain it, he must be shown its relevance by means of some apt illustration or anecdote.

Feature Programmes: These usually last for 30 minutes, which is long enough time to give the average listener not merely a fuller treatment of a subject, but in addition, to give him some idea of the richness of its associations, and its bearing and influence on many different aspects of life. At the end of the broadcast he should—if the programme was all that it should have been—"sit back entranced and ask for more" In the hands of a talented script-writer, the programme assumes all the grandeur of a great musical composition, or of a great canvas, depicting life and movement with all its colourful variety and strong vitality, and yet each section, part of a definite pattern, subordinate to and embellishing one theme.

All this would have to be conveyed through sound, and so the resources of music, the skilful use of different voices and appropriate background noises must collectively suggest the richness and variety of the factors that "build up" the main theme—whether it is an episode in the life of an individual or nation, or a "period piece" of literature—so that the listener feels that he has truly entered into the very life of the times depicted, participating in the stirring events, and capturing something of its true significance.

To achieve success with such a programme requires besides a thorough acquaintance with the historical and other factors, the priceless gift of imagination, and "selection" out of a whole host of materials. It also requires a thorough understanding of the materials one has to work with so as to use them to advantage. It may be that the programme is merely to provide entertainment; it may attempt a dramatic situation or give a "slice of life". But whatever the end in view, its presentation must be made as convincingly as possible. The characters must be real people, speaking and acting as real people do.

Study of good radio-plays may be a great help to the script-writer, notably those entitled "The Man born to be King"—by Dorothy Sayers. The B.B.C. quite frequently broadcasts such programmes, and anyone who wishes to write acceptable scripts, could do no better than listen-in to these very carefully.

So much for the preparation of a good script, which, to recapitulate, must be characterised by having a definite object, clear argument, illustrated with concrete examples and avoiding abstract principles, interestingly handled, above all convincingly presented with appeal both to the intellect and the feelings.

Programme Production: Granted that it measures up to these requirements, the script should then be tested for the time-limits imposed by the Radio Station. If the talk is scheduled for 15 minutes, the maximum length of time for reading through the script at the required speed, should be $14\frac{1}{2}$ minutes—giving some time to the Talks-department to make the introductory and closing announcements. For all programmes this half-minute allowance to the announcer must be made.

The Importance of the speaking voice: The talk has now to go "on the air": the human voice has to translate the written word into a powerful instrument, charged with meaning, life and energy, stirring both the mind and the emotions of the listener and reaching down if necessary, to the hidden springs that control action.

It must not be thought that this description of what is expected of the human voice is an exaggeration. The best of scripts can be marred by a faulty "rendering", while a good broadcaster can do much to put life and vitality into an indifferent script.

The natural endowment of a good voice is a priceless asset, but practice can improve its broadcasting qualities—which are flexibility, pleasing conversational tone and clear enunciation. One has to remember that certain sounds, chiefly sibilants, are exaggerated by the microphone, and not only cause distraction to the listener, but mars the whole broadcast.

Rehearsals: their necessity: Rehearsals therefore are most necessary. One must be completely familiar with the script and thoroughly sure of the meaning of each sentence and phrase so that the reading flows easily and smoothly—not only without hesitations or stumbles, but with a certain spontaneity that conveys the sense of complete naturalness and sincerity.

If this note of spontaneity is missing, a certain artificiality results, the talk is not a "talk" any longer and therefore fails to carry conviction. If the "reader" does not know his script thoroughly, he may fail to give the proper inflexion—the altering of the vocal pitch, according to the meaning—at the required places, and so to distort the meaning, if not to render the passage meaningless.

Rehearsals and practice will also help to correct many other defects of which one is quite often unaware, such as faulty breathing. When one is tackling long sentences or a long paragraph, it is essential to control one's breathing, else one is sure to be caught out of breath before a sentence has come to an end, or has not enough breath to give the necessary emphasis to words and phrases which require such stress.

Other faults that the beginner has to learn to avoid can best be corrected in the studio itself. These concern the tendency to speak either too near the mike, or to speak unduly loud. A normal conversational tone is what one should aim at: and it is surprising how often beginners forget this. The studio-director could be asked to have a "cut" made on a record of some part of the rehearsal. When this is played back the reader can more readily detect and correct many other imperfections, some little, some serious, due to wrong speech habits such as a tendency to jerkiness, poor articulation or unsuitable tonal quality of the speaking voice in certain passages. Practice to eradicate these is essential: the improvement that will result is worth the trouble.

For "radio-plays" and for "feature programmes", many rehearsals, both outside and in the studio, are necessary if the broadcast is to be considered at all good and if it is to be effective. The amateurish, slap-dash efforts of hastily got up groups, is severely to be discountenanced. A poor reputation for broadcasting is not easily overcome and further invitations to produce such programmes will not be forthcoming. In this as in other matters, enthusiasm cannot make up for insufficient practice.

This is particularly true of programmes requiring several voices. Only when the persons taking part have worked together as a team can the production reach a high standard.

Musical Broadcasts: What has been written above applies equally for musical broadcasts, whether of an entire or a partial programme of music. The musical-director or choir-master should satisfy himself as to the requisite training of his orchestra or choir, and must have complete charge of his part of the programme. Studio-rehearsals will give him that complete understanding with the Programme-director, and with his own performers, and with many technical points that would ensure the success of the broadcast.

Christmas and Easter Broadcasts: The different broadcasting stations of All India Radio, plan to have good "feature-programmes" at the time of these great festivals. AIR would welcome the co-operation of the local Christian Council or similar body, which would undertake to prepare a suitable programme for the occasion.

There is such a wealth of material that is available for the purpose that there should be no difficulty in producing something really first-rate and make the most of the opportunity while it lasts. The message of both these great events is of perennial interest and no one but can be moved by listening to this "Greatest story ever told"

Conclusion: The religious broadcaster knows that he has indeed "a story to tell to the nations". If he bears in mind what has been written above and acts upon the advice very humbly proffered, he will have gone a long way to ensuring that the story is well told.

Chapter 32

LEAFLET EVANGELISM

JOHN H. PIET[1]

A MAN once went out to sow his seed and as he sowed, some seed fell by the roadside some, among the rocks some, among thorn-bushes and some, on good soil. The man who sows sows the message." Those who receive it respond in various ways.

Does this mean that the sower must sow indiscriminately, or is there some way in which he can tell the type of response his message brings? If so, he can tend the seed that falls upon productive soil and thus cultivate what seems to be a promise of good results.

The distribution of leaflets followed by the sale of literature, audio-visual aids, and Bible Correspondence is one way in which response may be measured. Notice that none of these are ends in themselves, but taken together, they form a weeding-out process of some value.

1. Leaflets.

Leaflets written singly or in series are the seeds which the evangelistic sower sows. They are not ends in themselves but means to an end. That end may be the sale of books, an invitation to a church service, or the introduction of a Bible Correspondence course. Whatever it may be, the leaflet introduces the gospel and that something else at one and the same time. Leaflets, in other words, are the "John the Baptists" which prepare the way.

The following is a leaflet taken from a series of four, each of which introduces a particular gospel. The names of the four are:

"The Man Who Changed His Job": Matthew
"The Young Man Who Lost His Dhoti": Mark
"The Doctor Who Was Healed": Luke
"What Are You Living For?": John

The purpose of the leaflet "What Are You Living For?" is two-fold, as we shall see:

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"What Are You Living For?"

What are You living for? Does the question concern you? It should, because as someone said during World War II:

LIFE IS RATIONED—ONLY ONE TO A PERSON!

Life for you may mean one of two things. It may be an unpleasant dream which you seek to forget. Or, it may be vital and worth while.

The first attitude may be illustrated by a sea captain and the second by a fisherman.

A sea captain was once asked what he intended to do when he retired. He replied, "I am going to put an oar on my shoulder and

walk inland. As soon as anyone asks me, "What is that you are carrying?" I shall know that the people of that place know nothing about the ocean. *That* is the place where I will settle down."

The thirty-five years the sea captain had spent at sea were an unhappy dream which he sought to erase.

The Life of the fisherman is quite different. Like his grandfather and father before him, he spent many weary hours at sea.

Early each morning, he and his father and brother would launch out into the deep to catch fish. When they returned, they would tend to their boat and fishing equipment.

One day while the man and his brother were mending their father's nets, another Man came along who said, "Follow me, and I will teach you how to catch men" The two straightway left their nets and followed Him.

For three years, they lived with their Teacher. They heard Him speak. They saw Him heal the sick and comfort the poor. Rather than seeing Him catch men, however, they saw men catch Him and put Him to death.

When this happened, the two brothers decided to return to the sea. One of their friends said, "I am going fishing." They replied, "We will go with you."

There were seven in the fishing party altogether. They went out and got into a boat; but that night they caught nothing. Just as day was breaking, they saw a Man standing on the beach. He said to them, "Do you have any fish?" They answered, "No."

He said, to them, "Cast the net on the right side of the boat, and you will find some." So they cast it, and now they were not able

to haul it in, for the quantity of fish. One of the brothers thereupon exclaimed, "It is the Lord!"

Their Master was alive! The Lord was risen. He was risen indeed!

Death, then, was not the end of life. Before He died, the Master had said, ' because I live, you will live also." And here He was to show them what He meant!

What does it mean, " *because* I live, *you* will live also?"

In answer to the question, the fisherman wrote a small book called *The Gospel of John* which sells for one anna. There is a free Bible Correspondence Course called *Light of Life* based on the book.

Tomorrow about this same time, the people who distributed this leaflet will return with The Gospel of John and the first sheet of lessons for *Light of Life.* Have your anna ready to buy the book!

There will also be a free movie on the Life of Christ tomorrow. Ask those who sell the gospels where the movie is to be. Everyone is welcome.

In case you miss the person and wish to purchase The Gospel of John through the post, send a two anna stamp in a sealed cover to *Light of Life,* Post Box 66, Vellore, N.A. The book and the lessons will be sent to you immediately.

Remember:

LIFE IS RATIONED—ONLY ONE TO A PERSON!

There are other series, copies of which may be had from the N.C.C., Nagpur. The following is a series which uses selected stories from the Old Testament with an evangelistic emphasis:

Name of the Leaflet	O.T. Story	Evangelistic Appeal.
"The Greatest Drama in the World"	Creation story.	Jesus who created the world likewise came to redeem it.
2. Hide and Seek	Adam and Eve the Garden.	Man Hides. God in Christ seeks.
3. "You Have been Warned"	Noah and the Ark.	The Person Who obeys God is the one who is ultimately saved.
4. "By Faith He Went Out "	The call and departure of Abraham.	Faith does not mean that one knows the way but that he is willing to follow the One who does.
God Hath Provided	The sacrifice of Isaac.	God, in Christ, has the Lamb.
6. What happens when we Die?	Moses and the Burning Bush.	God is the God of the living, not of the dead: eternal life.
"When I the Blood"	The Passover.	"You were ransomed with the precious blood of Christ like that of a lamb without blemish or spot."
8. Once for All	The Ten Commandments and the Holy of Holies.	Christ has removed the veil, we no longer live by law but by grace.
9. What is God Like?	Aaron and the Golden Calf.	Paul was brought up in the anti-idolatrous tradition of the Jews. How then did he ever come to write, "We see God in the face of Jesus Christ."

Each leaflet in the series follows as far as possible the progression indicated by Jesus when he said, "I am the way, the truth, and the life." The way starts where a person is. It leads him to the truth of the cross. Life comes through resurrection.

The fifth leaflet is printed in full to show this progression not only but the way in which the series and the place a leaflet holds in the series is indicated:

"When I See the Blood

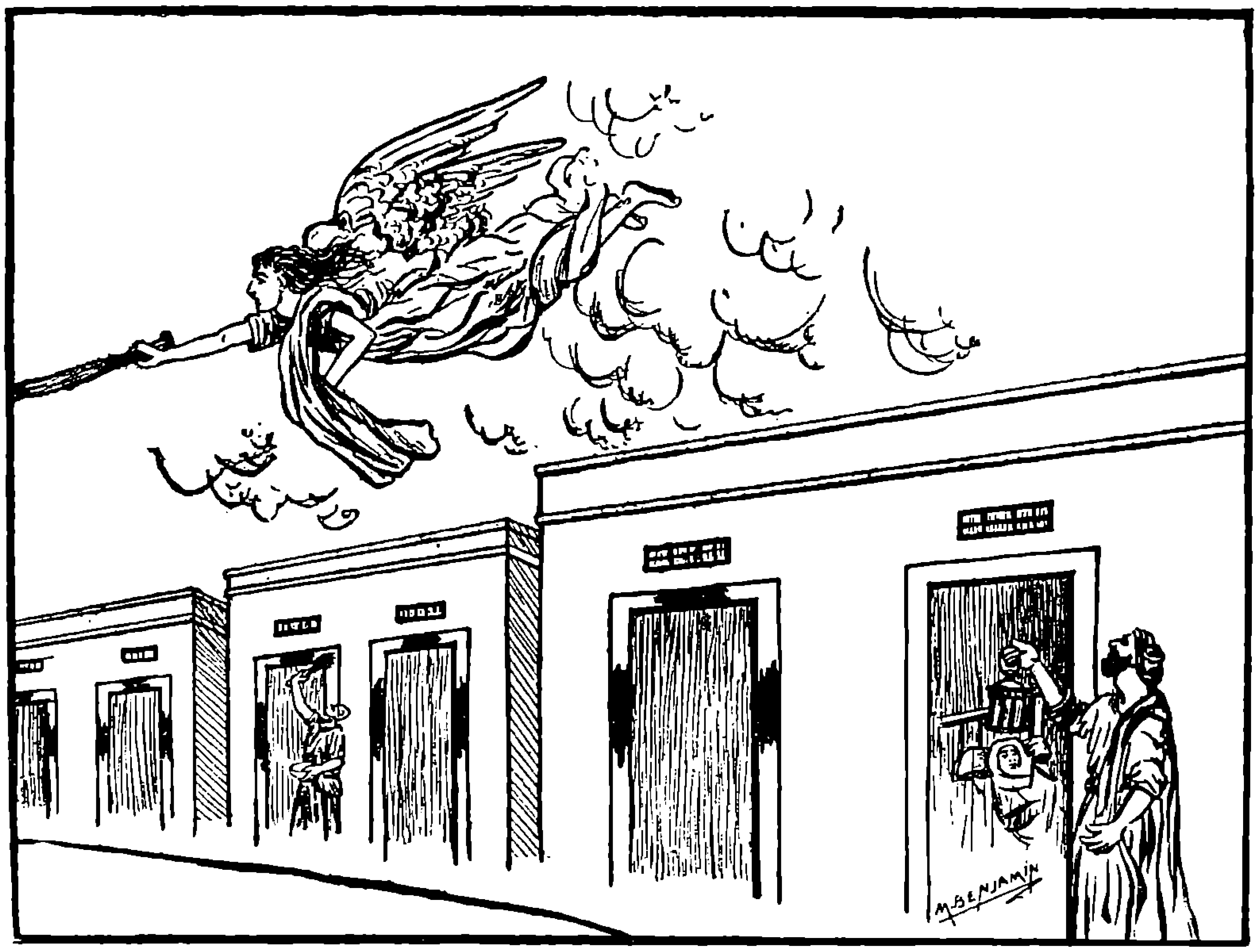
(Leaflet—7)

Everyone loves a festival. The jubilant spirit and gaiety of the crowd lift men above the hum-drum of life.

Religious festivals are usually the most jubilant of all. The religious significance of a festival, however, is often lost in the jubilation itself. In order to get the most out of it, one must recall the significance of the day.

There is a Jewish festival called "The Feast of the Passover" which has a deep religious significance. The Passover originated many years ago in the land of Egypt when the Jews were freed from slavery.

The Jews had served the Egyptians four hundred years. In order that they might be free, God raised up a leader whose name was Moses.



When the king of Egypt refused to yield to the words of the Lord, the Lord sent ten different kinds of plagues upon the Egyptians by means of Moses. At the height of each, Pharaoh, the king, begged for mercy. Each time he promised to let the people go. As soon as the plague was called off, he broke his promise.

Finally, the Lord said to Moses:

"This month shall be for you the beginning of months; it shall be the first month of the year for you. Tell all the congregation of Israel that on the tenth day of this month they shall take every man a lamb according to their fathers' houses, a lamb for a household; and if the household is too small for a lamb then, a man and his neighbour next to his house shall take according to the number of persons: according to what each can eat you shall make your count,

for the lamb. Your lamb shall be without blemish, a male a year old . the whole assembly of the congregation of Israel shall kill their lambs in the evening. Then they shall take some of the blood, and put it on the two doorposts and the lintel of the houses in which they eat them. They shall eat the flesh that night roasted; with unleavened bread and bitter herbs they shall eat it. In this manner you shall eat it; your loins girded, your sandals on your feet, and your staff in your hand; and you shall eat it in haste. It is the Lord's passover. For I will pass through the land of Egypt that night, and I will smite all the first-born in the land of Egypt, both man and beast; and on all the gods of Egypt I will execute judgments: I am the Lord. The blood shall be a sign for you, upon the houses where you are; and when I see the blood, I will pass over you, and no plague shall fall upon you to destroy you, when I smite the land of Egypt." (Exodus 12: 1-13)

The word of the Lord came true, because:

"At midnight, the Lord smote all the first-born in the land of Egypt, from the first-born of Pharaoh who sat on the throne to the first-born of the captive who was in the dungeon And Pharaoh rose up in the night, he, and all his servants, and all the Egyptians; and there was a great cry in Egypt, for there was not a house where one was not dead. And he summoned Moses by night, and said, 'Rise up, go forth from among my people, both you and the people of Israel: and go, serve the Lord, as you have said. Take your flocks and your herds, as you have said, and be gone; and bless me also.' " (Exodus 12: 29-32). This is the origin of "The Feast of the Passover"

The story is told of a Jewish boy who lay sick upon his mat. Although the father loved him dearly, he was too concerned with the Passover preparation to pay much attention to him. The boy understood because he too was keenly interested.

As he lay restless upon the mat, the boy turned to his father and said, "Father, I am your oldest son. Tonight, the angel of death will pass over. Have you sprinkled the blood on the doorposts?"

"Yes, my son," replied the father. "I have commanded the servants so to do."

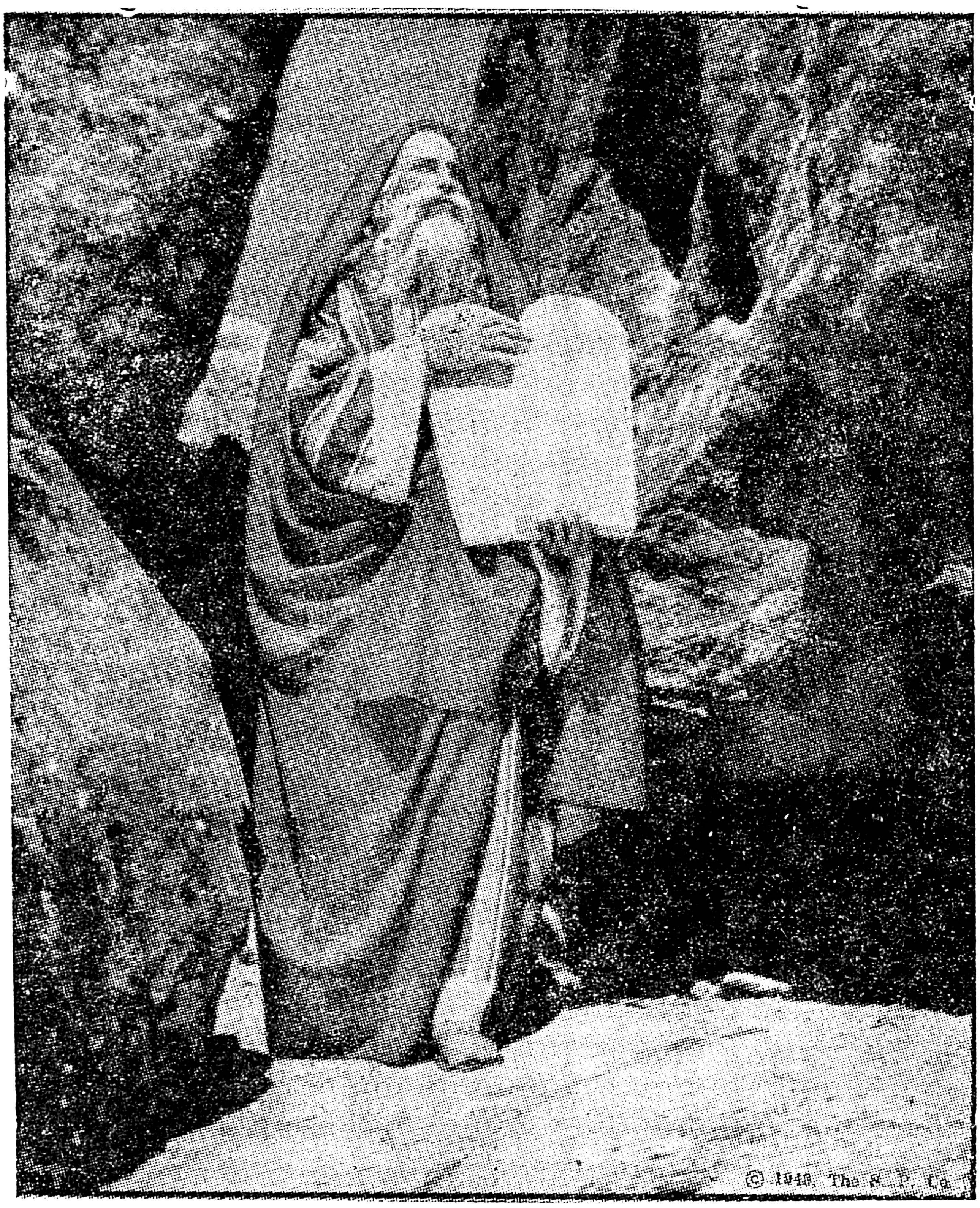
The boy was not satisfied. In a little while, he asked his father the same question. His father assured him that all was well.

But the boy was not satisfied. He said to his father the third time, "Father, are you sure the blood has been sprinkled as the Lord gave command?"

In order to re-assure the son, the father stepped outside. When he turned to look at the doorposts, he heard the sound of wings. It was the angel of death. What is more, there was no blood on the doorposts! He returned to his son who lay upon the mat, but his son was dead.

The angel of death will some day call for each one of us. When he comes, will he see the blood—the blood of Jesus Christ?

The Bible teaches that Jesus is the Passover Lamb who was sacrificed for us. (I Cor. 5: 7). It reminds us, "You know that you were ransomed. . . . with the precious blood of Christ like that of a lamb without blemish or spot." (I Peter 1: 19).



BLOCK MADE FROM BLACK AND WHITE PRINT

When God sees this blood, He will pass over, and we shall not be touched by "the second death", which means that we shall live forever with Him. When the angel of death passes over, will he see the blood of Jesus—on you?

Steps by which you may come to know Jesus:

Buy a gospel for one anna. There are four different gospels: Matthew, Mark, Luke and John.

Join a Bible Correspondence Course called "The Light of Life". This takes you through the Gospel of John. Lessons free. Write to Box 66, Vellore, N.A.

Consult with any member of the Church of South India—particularly the local pastor or missionary.

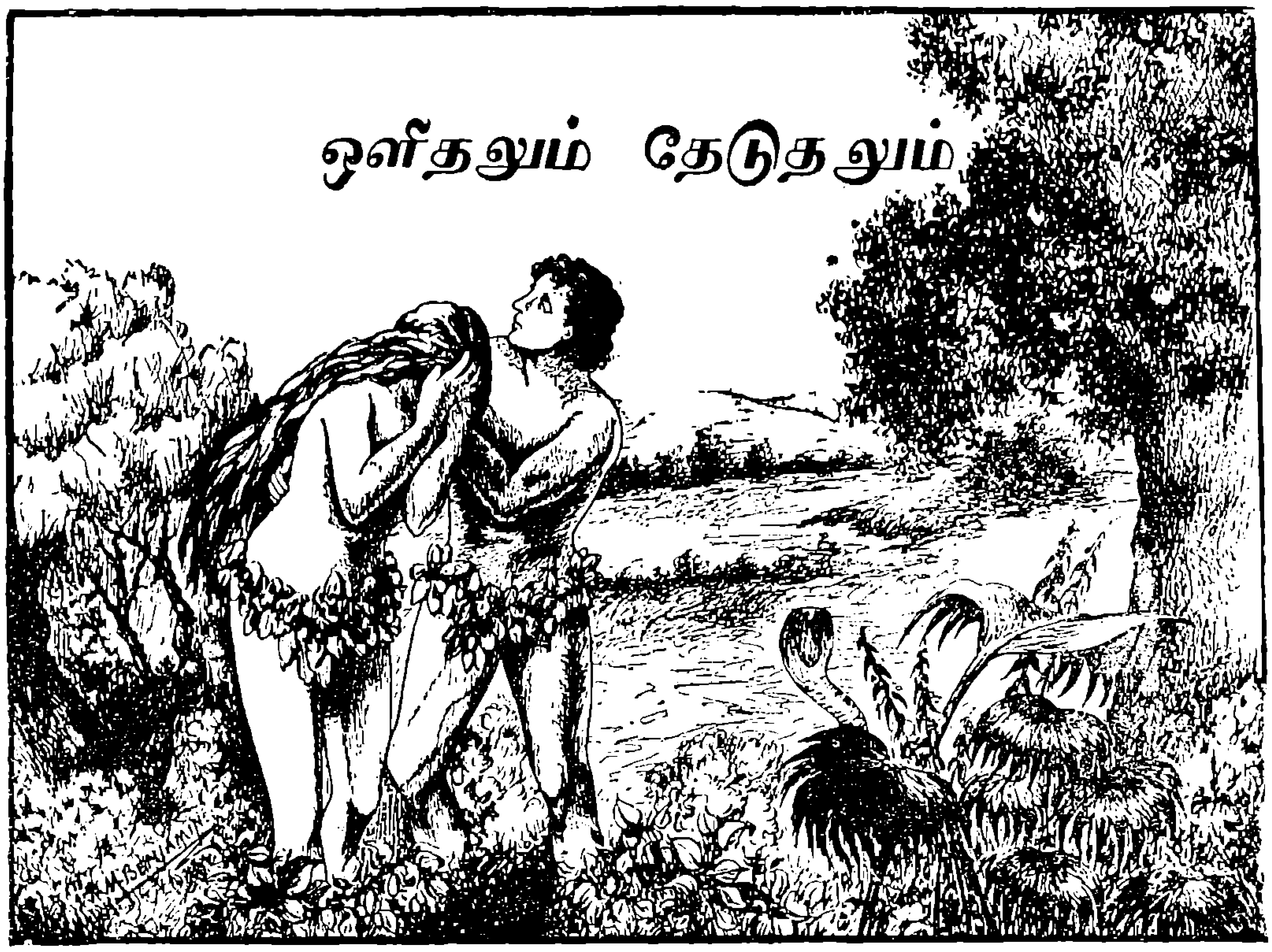
Leaflet 6 was: What happens when we die?

Leaflet 8 will be: Once for All.

If you have not received the previous leaflets, please ask for them or write to Box 66, Vellore, N.A.

Series V. Leaflet 7.

By means of these little helps, those who receive the leaflets are encouraged to look forward to the next leaflet and to see that they get those they have missed. Villagers have been known to walk



BLOCK MADE FROM LINE DRAWING WITH TOO MANY LINES

several miles to the resident pastor to ask for what was lacking in their particular series.

The fact that definite references are given where further help may be sought cannot be overemphasized. These references may take various forms. Each should be specific and definite.

Illustrated leaflets are more popular than those that are not illustrated. Pictures, like the material of the series itself, should follow a given pattern.

Blocks made from black and white pictures tend to be indistinct. This is even more so if they are made from coloured prints. Blocks made from line drawings are the best. The fewer and bolder the lines, the better the reproduction. Study the following illustrations carefully:

The correlation between the picture and the written word should be obvious. Otherwise, the picture will detract.

Bible women have found pictures helpful. While the story of the leaflet is read, the members of the household class follow by studying the picture. The story of Adam and Eve in the Garden brought forth the following comments:

"Yes, there is the snake!"

"See, they do not have clothes on—they are naked!"

The use of flannelgraph material to coincide with both leaflet-story and picture makes leaflets even more effective.

Leaflets, like other material of this kind, must speak to an age level, an economic level, or an educational level.

BLOCK MADE FROM LINE DRAWING WITH FEWER AND BOLDER LINES

There is no "general, all-purpose" leaflet. There is the mind of the child, the mind of the young-adult, the mind of the farm-labourer, the factory labourer, and the university student. Leaflets must be written for "him", and "he" must represent some particular group.

Leaflets may be written for the educated. These may be subdivided into those who are interested in religion and those who have no particular interest. There are those who seek the truth and those whose lives are a vacuum created by the tides of political thinking. Religion for these latter has not kept pace with the growth of democratic ideals. The result is that since religion and the democratic way of life cannot be balanced, religion is neglected.

Leaflets may be written for those who are not well educated. These again may be subdivided into those who are orthodox and those whose orthodoxy has given way to silent indeterminism.

The child between ten and fifteen is a good age level with which to work. The reason is that most of them are becoming literate not only, but the majority of them are studying in non-Christian schools. If they through literature can be helped, it is a good thing. Further, the dearth of material for this age group is so great that it is wise to fill the gap with good literature before others fill it with trash.

B. The Distribution of Leaflets.

Leaflets may be distributed in a number of ways. The following have been tried and proved successful.

A. In Tinnevelly, fifty pastors were each given a Boy Scout who took them to the section of the city assigned to them. Each pastor thereupon distributed 200 of the leaflets entitled "What Are You Living For?" to every home and shop in that area, making a total distribution of 10,000. The next night, each pastor returned to the same area with the Gospel of John and the first sheet of the Light of Life Bible Correspondence Course. One thousand twenty-two gospels were sold that night and over fifteen hundred attended the drama.

B. In Vellore, a series of six leaflets were distributed throughout the church year by students. The schedule was this: July: Meet Jesus Christ; September: Read the Bible; November: Join the Church; December: Merry Christmas; February: Christian Social Work; and April: Easter. Groups of students were assigned to various wards, and within two hours the entire city was covered.

C. In Ceylon, a pastor called for volunteers from among his congregation. The distribution took place immediately after the morning service. Those who took part were assigned a particular street. The walk home from the church meant much more to those who carried leaflets than it did to those who did not. The fact is, the program engendered so much enthusiasm that the members of the Roman Catholic Church asked if they too might co-operate.

D. In Assam, the entire province was covered. Materials were prepared for several thousand churches in at least a dozen different languages. Each church was asked to evangelize its own area. Instruction in methods and other details such as sharing inspiration went down from a select committee to the local groups. Four teams were taught during a retreat. These teams then worked with other teams from various sections of the province. The theme for the campaign was: Know the Faith—Live the Faith—Share the Faith. Further information regarding this campaign may be obtained from Rev. M. J. Chance, A.B. Mission, Colaghat, Assam.

E. In the Vellore-Katpadi area, four cycle evangelists are used. Each is assigned a number of villages or at times streets in the city.

The villages or streets chosen are visited once each week until the series is finished. This area is then allowed to rest while another area is chosen.

After the second or third leaflet, the cyclists sell inexpensive booklets. The price of literature is gradually increased. Each cyclist now sells no less than five hundred booklets a month. One cyclist sold Rs. 50 worth of literature in a two-week period.

Supervision work is easy, since all one needs to do is select a few houses or shops in each area to see whether the leaflets have been given.

F. Christian teachers in both Christian and non-Christian schools have been used to distribute leaflets. They have standing in the community not only, but their students cover a wide range of territory.

What is more important than wholesale distribution is the time-lapse between leaflets. A period of one or two weeks at the most is best. In Gudiyatam, a medium-sized town, the distribution was cut from a monthly to a weekly one. The result was that over six hundred gospels were sold in the first four-week period.

A weekly distribution of a series of eight will take two months. The area may then be allowed to rest and another area chosen. Meanwhile, further leaflets may be prepared so that the first area may be covered again. In this way, the seed is allowed to germinate and the soil prepared for further material.

The sale of inexpensive literature coupled with the distribution of leaflets is an effective index to response. Some sections of a city and some villages will buy a great deal. Others will prove adamant and sterile. It stands to reason that it is best to concentrate further efforts on those places where literature is sold.

Literature must be within a certain price range which means that it is cheap enough so that low-income groups can still pay. Three-pie, half-anna booklets whet the appetite so that one-anna, two-anna, and even more expensive material may be sold later. The pyramid builds itself until people are willing to buy the New Testament and Bible.

Follow-up work can be done through audio-visual programs, evangelistic camps, or both. Charts which show the sale of literature in the various centers help to determine where these programs should be. What is more, these charts are as accurate an indication of where response can be found as anything one can get.

The following six-week audio-visual program was used in each of five villages where literature was sold in large quantities. The five villages were chosen from among two hundred or more where leaflets and literature were found:

Week 1: Slides: The Childhood of Jesus (Book 1) (1)
Movie: The Child of Bethlehem

Week 2:	Slides:	The Miracles of Jesus (Book 2)
		The Teaching of Jesus (Book 3)
	Movie:	The Blind Beggar of Jerusalem
Week 3:	Slides:	The Ministry of Jesus (Book 4)
	Movie:	A Certain Nobleman
		Unfaithful Servant
Week 4:	Slides:	The Parables of Jesus (Books 7 & 8)
	Movie:	The Prodigal Son
		The Good Samaritan
Week 5:	Slides:	The Passion of Jesus (Book 5)
	Movie:	Barabbas the Robber
Week 6:	Slides:	The Resurrection and Pentecost (Book 6)
	Movie:	The King of Kings

(1) The slides were taken from Elsie Anna Wood's S.P.C.K. Giant Picture Book.

In each case, the choice was fully justified. What is more, further interest in literature, particularly Bible correspondence was created in each of the five villages.

A possible appraisal of leaflet evangelism may be had from the comparative figures relative to the sale of Biblical material over a period of years. The facts are these:

Sale of Bibles, New Testaments, and Gospel Portions:

1. From September 1, 1948 through December 31, 1952 (Three years and four months)	42,549
2. From January 1, 1953 through July 31, 1954 (One year and six months)	20,572
	63,121

The average for the first period is 1,063 books a month and for the second, 1,143.

Detailed sales for the second period are:

1. Bibles: 372
2. New Testaments: 825
3. Gospel Portions: 19,377

The Sale of Christian literature is even more suggestive:

1. From September 1, 1948 through December 31, 1952	42,934
2. 1953	31,077
3. The first six months of 1954	22,632

The figures pertain to the four pastorates in which the cycle evangelists mentioned above do their work.

II. Newspaper Evangelism.

Newspaper evangelism like the distribution of leaflets is not an end in itself but a means to an end. The articles print the message

of salvation, no doubt, but they look forward to further contact as well.

As in leaflets, the development of material is advisable. While each article is a unit, it likewise contributes to a larger and more progressive whole.

A series on the Apostles' Creed was printed in several Indian papers. The articles of the Creed were reversed so that they began with Eternal Life, the Resurrection of the Body, the Forgiveness of Sins, and so forth until the great declaration of faith was reached: I Believe in God. The reason for this was that the last article of the Creed starts with an inherent desire in man and by reversing the order this desire is led back to the God in Whom this desire is met.

When dealing with secular papers, it is advisable whenever possible to use direct quotations from the Bible. The Bible speaks with an authority all its own not only, but it saves the editor embarrassment, because it allows him to say that he is only printing material from one of the world's great sacred books.

Furthermore, the object of newspaper evangelism is to transfer the reader's attention from the paper to the Bible itself. Actual Biblical quotations allow the reader to see the beauty and power of The Book in a way that personal recommendations do not. One must never assume that the reader has read anything of the Bible at all.

A cross, a Christian picture, a cartoon, or design should identify the articles of a particular series. One group uses a white cross made by black lines set off with a shadow effect. Needless to say, every reader knows at a glance what the reading matter will be.

Below is an example of a cartoon series based on the vitality and happiness available for those who accept Christ. Most of the ads. were based on The Sermon on the Mount. The idea behind the series was: Do you look like the man on the right or the one on the left?

Whom Do You Look Like?

Do the corners of your mouth turn up or down? Are you like the man on the right or the one on the left?

A great teacher promised that his way of life makes people happy. Many through the years have found his promise true.

Sad, disappointed, discontented people came to him every day to ask how they could discover happiness. He replied, "Blessed are the poor in spirit, for theirs is the kingdom of heaven. "Blessed are the meek, for they shall inherit the earth. "Blessed are the pure in heart, for they shall see God."

"Blessed" means "Happy" Look at the rest of Jesus' Beatitudes which are found in Matthew 5: 3-11: Gandhiji read these often and found joy and strength in them. So can you.

If you want to learn more about the secret of HAPPINESS, write for the famous Bible Course which is FREE upon request: Box 66, Vellore, N.A. Cost of Book: a two anna stamp.

Here, on the other hand, is a more sober article taken from a series published during Lent. The Line drawing of the head of Christ identifies the article. The text is taken directly from Luke.

THE DEATH OF JESUS

"Two others also, who were criminals, were led away to be put to death with Jesus. And when they came to the place which is called the Skull, there they crucified him, and the criminals, one on the right and one on the left. And the people stood by, watching; but the rulers scoffed at him, saying, 'He saved others; let him save himself, if he is the Christ of God, his Chosen One'."

"Then Jesus, crying with a loud voice, said, 'Father, into Thy hands I commit my spirit!' And having said this he breathed his last."

Is this the end of the story? See Sunday's paper for the sequel.

Bible Correspondence Course free upon request: Box 66, Vellore, N.A. Price of book: a two anna stamp.

This ad. was used in a Tamil daily on Good Friday and drew a response of over 600 for Bible Correspondence. One hundred fifty two-anna stamps were received for the purchase of John's Gospel.

This is what is meant by saying a newspaper ad., like a leaflet, should lead to something else. The ad. may elicit questions, may advertise a particular gospel, the New Testament, or the Bible. Whatever it may be, the reader should be told where he may seek further help if he so requires.

III. Bible Correspondence.

For one who is agreed that the order of evangelism is first the Bible, then the convert, and finally the church, the primary object of the evangelist is to get people to read the Bible. Most readers, however, are like the Ethiopian eunoch, who when asked if he understood what he read, replied, "How can I, unless someone guides me?"

Bible Correspondence is a partial answer to that question. It meets the need of two particular groups: (1) it guides those who have no ready access to Bible classes either because of time or the

inavailability of such a group, and (2) it teaches those who like Nicodemus would "see Jesus by night". The privacy of the post is a wonderful answer to many who seek to know more but who seek to know by themselves.

There are many who have come in contact with Christ but who when that contact was made did not avail themselves of the opportunity. The contact may have come through a Christian school, a hospital, social center, or personal conversation. Whatever the case may be, Bible correspondence allows them to renew that contact and to find out more of what the Gospel has to offer.

Most Bible correspondence courses are based upon the text alone. The student is guided by means of questions, the answers to which he must find himself.

When The Light of Life course was written, for instance, a chart was made based on John 20: 30-31: "Now Jesus did many other *signs* in the presence of the disciples, which are not written in this book; but these are written that you may *believe* that *Jesus is the Christ,* the Son of God, and that believing you may have *life* in His name."

A Segment from the chart is given below:

Signs	Believe	Jesus, the Christ	Life	Know
	5: 38		5: 39	
			5: 40	
	5: 44			5: 42
	5: 46 (2)			
6: 2	5: 47 (2)			

Questions were based on the chart so that when the student finished, he will be brought face to face with the purpose of John as stated above.

Light of Life, like other correspondence courses, is advertised through leaflets, the newspaper, and the students themselves. Although all Bible correspondence schools do not follow this procedure, —the Tamil course sells the Gospel for half price with the first sheet of lessons and the registration card enclosed. As soon as the answered paper and the card are returned, the lessons are corrected, the card removed, and the following program of lessons sent:

Front of registration card:

Name...

(Write your full name in capitals, exactly as you will want it to appear on your certificate)

Number and Street...

Village or City...

Post Office..

Taluk...............................District.................................

State................................Age............Religion.......................

This will be our permanent record card for you. Please write the information accurately and neatly, and RETURN IT WITH YOUR FIRST LESSON.)

Back of Registration card:

(Please do not write anything on this side. This is for our office record).

Name.................................... Number...........

Address.................................

3-6	15-18
7-10	19-24
11-14	Certificate

Remarks

Wherever possible, tracts or Scripture Gift Mission booklets are enclosed so that the student receives more reading material. When the certificate is issued, a book of daily devotions is sent.

During the course, each student gets three cards by means of which he introduces his friends. The text of the card is given below:

Front of registration card:

Please give this card to one of your friends

My friend has given this card to me. By means of it, I would like to enroll as a student of The Light of Life Bible Correspondence School.

My Name...

(In Block Letters)

My Address...

(Please read the reverse side as well)

Back of registration card:

All you need for The Light of Life course is a Gospel of John. We will send you one for a two anna stamp. Please place the stamp in a sealed cover. We take one anna for the gospel and one anna for the postage. Actually, the postage is 1½, but we will bear that expense.	Nine pies Stamp
	To:
If you do not hear from us within a week of your sending us the stamps, please send a reminder to us by post card.	Light of Life Box 66 Vellore, North Arcot
(1)	

(1) This line must be exactly in the center of the card to meet Post Office regulations.

As soon as a student completes the course, his card is taken from the file and placed in the "passed file" Here it is arranged according to districts so that any pastor or recognised Christian worker may find the names of the students in his own area. In this way, the local church can do personal work with those who have taken Bible Correspondence.

Conclusion:

The local church is the point at which literature evangelism ceases. It is here where personal evangelism begins. Leaflets, newspaper articles, and Bible Correspondence merely aid in determining where and who the interested people are. They are indexes and indications to the sower which tell him which seed is falling upon good ground.

Chapter 33

FIRST DAYS WITH A CAMERA

H. ROSS BUNCE, JR.[1]

THOUSANDS of words have been written for the individual who is passing his first days with a camera. The following words are not intended to add to this extensive library but to condense the few main thoughts which seem to be important for the beginner. It may be an over-simplification of photography but in all truth these words, when referring to the technical side of picture taking (as separate from the artistic, pictorial side) can be reduced to the discussion of two variables the understanding and control of which will give the beginner complete confidence in the technical outcome of his negatives. These two variables are: (1) *focus,* and (2) *exposure.*

FOCUSSING

Without going into all the mysteries of light refraction, the *lens* of a camera serves to bend the light rays spreading out from a single point back again into an image of that point. If there is a fixed point and a fixed surface on which the image of that point is to fall, a lens must be inserted between the point and the surface at a distance far enough from the surface to bring the rays of light into an exact image of a point on the surface. This distance from surface to lens depends on the distance from the lens to the original point. In a camera the surface is a piece of sensitized film, the fixed point is a subject and the camera is designed in such a way that the film-to-lens distance can be varied to match a corresponding variance in the lens-to-subject distances with which the camera will cope. This variable adjustment of the lens is called *focussing.*

Three general methods are in common use to achieve an accurate focus:

1. A range finder is used which may or may not be coupled to the lens. This is an instrument which takes advantage of the ancient navigational principle of triangulation to determine distance

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[1] Rev. H. Ross Bunce, Jr., B.A., B.D., educated in Albion and Yale Divinity School has had a long interest in photography. He is Manager of the Boys' Hostel, Parker Higher Secondary School, Moradabad, U.P,

of subject from camera. A reflection of the subject is superimposed on a direct view of the subject by adjusting the angle of a tiny mirror. This adjustment moves a scale to indicate subject distance. In a coupled range finder the adjustment of the mirror also adjusts the lens to a proper distance from the film surface to match the subject distance.

2. All press cameras, studio cameras, and various types of reflex cameras use a method employing ground glass on which the image of the subject appears just as it will appear on the film. As one camera advertises, it gives a preview of the picture. If the ground glass image is blurred, the lens is adjusted until the lines are sharp thus insuring equally sharp lines in the negative image.

3. On all cameras where range finders or ground glass are not available the lens-to-subject distance must be estimated or measured and the lens-to-film distance set by the use of scale which is marked with the various lens-to-subject possibilities. In the first days with a camera distance guessing should be kept to a minimum and some device employed for determining the subject distance within a foot or so of accuracy. This may be the simple expedient of pacing the distance with an even stride, or a piece of stout string with knots tied at five-foot intervals can be given to the subject to hold while the other end is carried toward the camera position. On all subjects less than ten feet from the camera a tape measure should be employed to give the distance within a foot of accuracy unless the lens in use has a focal length of 50 millimeters or less. (Focal length of a lens is usually marked on lens mount.)

DEPTH OF FOCUS

There is one other aspect to focussing which should be given full attention for its effect on the quality of pictures and its use in securing negatives with an over-all clarity and brilliance is often ignored. This is the characteristic of all lenses called *depth of field* or *depth of focus.*

The distance from the point nearest the camera which is in reasonably sharp focus to the point farthest from the camera in reasonably sharp focus is called the depth of focus. The heart of the focussing problem is the decision on how much of the entire picture area should be included in this depth and how much left out, and the second decision on how this effect will be achieved by proper adjustment of the camera.

The logical beginning of this explanation is behind the front element of the lens where a delicate little mechanism of interlocking steel leaves work in and out in a rotary pattern to provide a hole or *aperture* of varying diameter in the center of the lens tube. One purpose of this device is to control the amount of light reaching the

film during the interval of time provided by the shutter. The other purpose is to vary the depth of focus.

The arm which adjusts the diameter of this aperture moves along a scale on the lens mount consisting of a series of numbers preceded by the symbol f/. This symbol indicates the relation between the diameter of the aperture and the distance of the lens from the film when the lens is focussed on infinity. As the camera becomes more familiar curiosity will increase about the physical properties of lenses and the meaning of such terms and *focal length* and *lens speed,* but in the first days all that need be remembered is that the *smaller the f/ number the larger the diameter of the aperture and the larger the f/ number the smaller the diameter.*

On most modern cameras in the medium and high priced range a depth of field scale is made as a part of the focussing mechanism. It might appear on the lens barrel if the lens-to-film distance is adjusted by screwing the lens in and out of a threaded tube. Or it might appear as a dial surrounding the focussing knob if the focus arrangement racks the tube in and out by such a device. Or it might appear as an enamelled chart attached to the camera back or side. If such a table is not on the camera itself it almost certainly will appear in the instruction manual. The system in general use when the scale is part of the focussing mechanism provides a stationary plate marked with all the f/ numbers on the aperture scale counting away in both directions from a center line, and a moving plate which carries all the possible lens-to-subject distance in order past the center line of the former. If this depth scale were stretched out in a horizontal line it would appear somewhat as follows:

Moving Plate:

(Inf.)

00	60	30	20	15	10	8	7	6	5	4½	4	3½
	22	16	11	8	5·6	4	4	5·6	8	11	16	22

When the proper distance for the subject has been located opposite the center mark (in this illustration the camera is focussed at 10 ft.) the depth of field can be determined by consulting the distance opposite the two places on the stationary plate where the f/ reading then in use on the aperture scale is found. In the above illustration, assuming that f/11 is in use, the depth of field will be known to have a far limit of about 24 ft. and a near limit of about 5½ft. This means that everything from 5½ ft. in front of the camera to 24 ft. in front of the camera will seem to be in focus in the finished negative. Everything outside of that area, whether closer to the camera than 5½ ft. or farther away than 24 ft. will appear to be blurred.

USING DEPTH OF FOCUS

Two picture taking situations suggest themselves as illustrations of the way in which an understanding of depth of focus can be employed to serve the photographer:

A. A portrait of a village boy is possible if taken in a hurry and the only available background is a cracked and crumpling mud wall which by itself might have pictorial interest but which is far too distracting to enhance the features of the boy. This wall is judged to be about 15 feet from the camera while the boy is standing 10 ft. from the camera. Lighting conditions are such that an exposure of 1/50 of a second at f/16 is about right. Under these circumstances the wall will become a far better background if it is thrown out of focus by holding outside the far limit of the field of focus. Three procedures may be followed: (1) By consulting the depth of field scale it will be determined that a subject distance of 10 ft. at an aperture of f/16 (on a camera with a 75 mm. lens) gives a far limit of about 20 ft. and a near limit of 7 ft. *if the camera is focussed on the subject.* If, however, the subject distance is made the far limit of the depth of field by (in this case) bringing the 10 ft. mark on the moving scale opposite the f/16 mark on the stationary scale, then nothing beyond that 10 ft. mark will be in focus, thus including the boy but excluding the wall at 15 ft. (2) An even better procedure might be to maintain the focus at the subject distance of 10 ft. but shorten the depth of field by increasing the diameter of the aperture. By consulting the scale, it may be ascertained which aperture on the far side of the center mark gives a far limit which is less than 15 ft. when the center mark is on 10 ft. With the 75 mm. lens in use it will be shown that any aperture of f/8 or larger will have a far limit to its field which is inside 15 ft. For allowing a good margin between this limit and the wall, the f/5.6 reading is selected whose far limit is about 12 ft. when the camera is focussed on 10 ft. Again the wall will be excluded from the field. (3) Perhaps the simplest procedure is to move the camera closer to the boy and focus accurately on him. When the depth table is adjusted for a focus of 5 ft. the far limit of the field, even at the smallest aperture, will be no greater than 6½ ft. in front of the camera with a 75 mm. lens. The wall is considerably beyond this limit. However, the first two procedures are very helpful to know in many situations where lens-to-subject distance is fixed and similar results are desired.

Two notes should be added at this point:

(1) If the procedure outlined in A (2) above is followed, the shutter interval must be decreased in order to compensate for the increase of light admitted through the larger aperture. In this illustration the aperture was increased from f/16 to f/5.6, a distance of three stops on the f/ scale. This means that eight times as much light will be admitted (each stop doubles the amount of light

admitted), therefore the shutter interval must be decreased eight times. If 1/50 of a second was correct at f/16, then 1/400 of second is correct at f/5.6 (each shutter interval decrease decreases the light by half). (2) A rule-of-thumb measurement for depth of field which is convenient to know if a depth table is not available places the subject roughly one-third of the way into this field. This means there will be twice as much in focus behind the subject as in front, the exact distance being determined by the aperture in use.

B. The second picture situation consists of a mule train moving along a mountain ridge with the snow peaks in the background. The mule train should be as close as possible to the camera to preserve detail but not so close that the snow peaks are excluded from the range of the len's focussing power. This situation requires as deep a field as the camera possesses, therefore the smallest aperture must be used. It is also obvious that the farthest limit of the field must be *Infinity* (indicated by the sign oo or the abbreviation Inf. or by the 100 ft. mark on the scale). This is the point of focus for lens beyond which everything included in the lens range will seem in focus. On most cameras there is no further adjustment for focus necessary for any subjects beyond the 100 ft. mark which means that Inf. focus has been reached. If this is the farthest limit of the field then the Inf. mark is brought opposite f/22 which is the smallest reading on the f/ scale and the distance opposite the f/22 on the short side of the center mark is consulted to determine the near limit of the field. On a 77 mm. lens, this reading would give about 8 ft. as the near limit which means the camera can be no closer to the mule train than 8 ft. and maintain the animals in focus. If this procedure is compared with the traditional amateur practice of focussing either for the mountains (Infinity) or for the mule train (8 ft.) the traditional practice will be revealed as a waste of field depth. For at Infinity focus, the nearest limits of the field will be about 15 ft. which is 7 ft. farther from the camera than necessary, while at 8 ft. the far limit of the field would be no more than 15 ft. from the camera and the mountains would be hopelessly blurred.

EXPOSURE

Two adjustments must be considered together in discussing exposure for the amount of light reaching the film is dependent on the interaction of both. The first to consider is the *shutter*. The mechanism is usually one of two types—focal plane, or between-the-lens. The former consists of a piece of cloth or flexible metal in which slits of varying width have been cut. A spring device draws one of these slits across the surface of the film permitting light to enter as it passes. The relationship between the tension of the spring and the width of the slit gives a highly variable number of shutter speeds from as slow as 5 seconds on some cameras to a speed of 1/1200

of a second. The latter type of shutter is a thin steel disk, or combination of disks which slide between the front and near element of the lens actuated by a complex system of gears and springs. The speeds from such shutters vary from 1 second to 1/400 or 1/500.

There are two chief functions of the shutter: (1) Stopping subject and camera motion by limiting exposures to intervals short enough to exclude more than a single record of a moving point of light as it travels across the picture area; and (2) Controlling the amount of light reaching the film through a given aperture.

Concerning the control of subject motion a few basic suggestions can be given:

1. Pedestrians move about four miles an hour, which means that people walking TOWARD the camera require about 1/50 of a second exposure to prevent them from blurring, people walking DIAGONALLY across the picture area require a shutter speed of 1/100, and people walking directly across the picture area require 1/200.

2. Tongas and other horse-drawn vehicles move at moderate speeds of six to eight miles an hour which require (under the above direction classifications) 1/100, 1/200 and 1/400 respectively.

3. Motors and trains that are moving at 60 MPH require 1/400, 1/600 and 1/1000.

4. It is dangerous to expose groups of people in even stationary poses at less than 1/50 if clean-cut results are expected. And wherever light conditions will permit, even shorter intervals of 1/100 or 1/150 should be employed to lessen the chances of random gestures and movement taking the edge away from the lines.

USE A TRIPOD

Another source of motion in a picture is, however, often ignored in spite of repeated warnings by the manufacturers of photographic equipment. A camera held in the hand will move enough, no matter with what care it is treated, in any interval shorter than 1/50 of a second to soften any lines which should be sharp. This will be a source of particular disappointment for negatives destined to be enlarged. For consistently clean, sharp pictures no advice is more important than to make habitual use of a tripod.

The second control over light to consider is the *aperture* discussed under depth of focus. This control is used when the nature of the subject requires a fixed shutter speed to stop motion, or under most circumstances of picture-taking where depth of field is not a primary concern. It is much simpler to operate a camera at a standard shutter speed and adjust for light variations with the aperture arm.

It is very convenient to memorize the relationship between the aperture and the shutter so that variations in one dictated by the nature of the subject can be compensated for by proper adjustment in

the other to keep the exposure constant. Each shutter speed interval beginning with the slowest permits *half* as much light to enter as the preceding interval. Each aperture number (called *stops*) beginning with the smallest opening (largest number on the scale) lets in *twice* as much light as the preceding opening. This is a very convenient system of light measurement which allows a change of one stop on the f/ scale to be balanced by a change of only one stop on the shutter scale. The photographer need only remember the direction each lever should be adjusted. Every time the f/lever is moved to open the aperture (from a larger to a smaller f/ number) the shutter lever must be moved from a slower to a faster interval to balance the light. (This of course assumes that no change in the amount of light reaching the film is desired.) As an example f/16 at 1/50 of a second lets in no more or no less light than f/5.6 at 1/400 of a second.

TIME AND BULB

A note at this point may help if it refers to the letters T and B on the shutter adjustment scale. T means Time and indicates that the shutter opens when the release is pressed and does not close again until the release is pressed a second time. It is a convenient arrangement for long-time exposures of more than 10 or 15 seconds. B means *Bulb* (taken from the days of studio photography using pneumatic shutter releases) and indicates that the shutter will open when the release is pressed and close again when the pressure is removed. It is convenient for short exposures of 2 or 3 seconds.

The heart of the exposure problem, as depth of field is the heart of focussing, is determining how much and for how long the light reflected from the subject should be allowed to touch the emulsion of the film. Exposure meters have progressed a long way toward reducing this variable to scientific consistency. But meters are not the absolute answer to exposure and all photographers should practise the art of estimating proper exposure. This will not only help in those times when a meter is unavailable or requires too much time for the temporary nature of the subject, but it will also help in using a meter with discretion when it is available. For a picture area is composed of many different tonal areas which, on a meter's photoelectric cell, are all lumped together in one big average reading—unless the meter is used selectively. The practice of estimating which employs separate observations of the tonal areas with the intention of emphasizing some and subduing others will also discriminate the various areas from which a meter should be allowed to accept light.

The best way to develop skill in estimating light intensity is to follow the classifications of light source and light reflection provided in the instructions accompanying most packages of film. Accurate data on each exposure should be kept and compared with the finished negative to corroborate judgement. This should be continued until

negatives begin coming through with consistent technical excellence. These exposure tables are based on the quality of the sun (light source) and the reflecting ability of the subject. For indoor photography, the exposure is based on the distance of the light from the subject and the reflecting quality of surrounding walls. As a ready reference the exposure sheet from a Kodak package will look like this:

	Bright Sun	Hazy Sun	Cloudy-Bright	Cloudy-Dull
Brilliant Subjects	f/22	f/16	f/11	f/8
Bright Subjects	f/16	f/11	f/8	f/5.6
Average Subjects	f/11	f/8	f/5.6	f/4
Shaded Subjects	f/8	f/5.6	f/4	f/2.8

These apertures are to be used with the following shutter speeds depending on the type of film in the camera:

1. Panatomic-X (slow-speed, fine grain speed group) 1/25 of a second.

2. Verichrome or Plus-X (medium-speed, ortho or pan group)—1/50 of a second.

3. Super-XX (high-speed, pan. speed group)—1/100 of a second.

The quality of the sun on these tables is fairly descriptive, but the reflecting power terminology is subject to some arbitrary limits. *Brilliant* refers to a great amount of water or light colored roadway, or snow in the picture area. Also to distant landscapes and mountains with very little foreground. *Bright* considers the same scenes as *brilliant* with the addition of people who are less reflective and of foreground material. *Average* subjects include almost all normal out-of-doors photography of people and animals and near-by scenes of routine activity provided there is no shade. Shaded subjects are those where there is no surrounding object to cut out reflected light from the sky but enough protection from the direct sun to keep sharp contrasts out of the picture area.

This is a helpful table and quite accurate if used wisely, but a few exceptions should be noted. In the first place, if the sun is very bright error on the side of under-exposure is apt to occur. Especially in this country the light seems much stronger than it actually is and many pictures contain black masses of shadow without detail. Where there is quite a bit of shadow in the picture, it is better to increase the aperture one stop and chance the over-exposure of high-light areas. Eyes are also likely to be failable in the other direction in the shaded areas where light will not seem as strong as it actually is. It is very difficult to estimate reflected light. In such circumstances it is probably better to decrease the aperture diameter by ½ or even 1 stop.

In judging the finished negatives for comparison with the original

exposure data it is necessary to watch both shadow and high-light area carefully for they are the clue to correct exposure. If the shadow areas (the thin or even transparent parts of the negative) are completely blank or show only faint traces of picture, the negative is under-exposed. If the high-light areas (the black, dense sections) are so blocked up that it is difficult to see the outlines of a light bulb through them then the negative is over-exposed.

It is entirely appropriate to mention a variation from traditional picture-taking which will increase immeasurably the quality of most routine negatives. Instead of positioning subjects in raw sunlight with all its confusing array of intense contrast, it is far better in the first days with a camera to use the open shade classification. The light is far more even and free from heavy tone separation while exposure under very different subject conditions tend to be more consistent.

FILMS AND FILTERS

In considering the correct film to use for varying picture conditions three factors should be understood: (1) speed, (2) grain and (3) colour sensitivity. Speed depends on the chemical sensitivity of the film emulsion and can usually be determined by the numbers on the package or by the rather stereotyped labels used by various manufacturers. These film speeds fall into three main speed groups; low; medium, and high. All American film is measured by a system developed by the Bureau of Standards called ASA. Under this system, the popular roll films are numbered as follows to correspond to the three groups; 25, 50, and 100 (there may be a difference of ten or so one way or the other depending on the company, but such differences effect the exposure in no practical manner). Continental and English films are more likely to be marked with a measurement called Degrees Scheiner than any other. Under this system the three groups (again with slight variations between manufacturers) are given 27°, 30° and 32°.

	Kodak	Ansco	Gevaert	Ferrania	Ilford	Agfa
High-Speed	Super-XX	Superpan Press	Ultra-Pan	Super-panchro	H.P.3	Isopaniss
Medium-Speed	Verichrome	Plena-chrome	Super-chrome		Selo-chrome	Iso-chrome
	Plus-X	Supreme	Panchro-mosa		F.P.3	
Low-Speed	Pantomic-X				Pan F	Isopan

The exposure difference between each of these groups is one shutter interval, each group being, for all practical purposes, just twice as fast as the preceding one.

The property of *grain* in a film is visible on the negative as tiny dark clumps or dots giving somewhat the appearance of a coarse

newspaper picture. The slower the emulsion speed of a film the less grain appears, the faster this speed the more grain appears. Although this graininess of negatives can be controlled to a great extent by the development process it still holds that small negatives destined for enlargement should come from the medium-speed groups. The low-speed group in fact is designed solely to produce tiny negatives which can be enlarged to many times their original dimensions without showing grain.

Colour sensitivity refers primarily to red sensitivity. A film that is called *orthochromatic* ("pan") is sensitive to all colours. The primary difference in these films of interest to beginners is in processing and rendering of sky tone. With ortho film a red light of proper intensity can be used to see the processing operations, with pan film processing must take place in absolute darkness. Ortho film, also, fails to record all of the red lights in the sky and thus is unable to make as deep a contrast between the white of the clouds and the blue of the sky as pan film can make owing to the amount of red light involved in this contrast. And a final difference is, of course, that the dramatic effects of sky rendition possible with a red filter are possible only on film sensitive to red. On the trade label list above all the films are *panchromatic* except the ones ending in "chrome" which are *ortho.*

The chief use of colour filters in black and white photography is to deepen sky tone. A blue sky is rendered as a very pale grey unless some or all of the blue is held back and prevented from exposing the film. Such selective under-exposure of the sky area is the method employed in most photographs where pleasing cloud formations have been captured.

Only blue sky, however, can be controlled in such a way for an overcast, grey sky will penetrate any filter and expose as it looks to the eye. If sky is blue, a yellow filter will hold back some of the light, a red filter will hold back most of the blue light, and a green filter will act about as a yellow filter but at the same time will under-expose all the green foliage in the picture thus giving a greater contrast between sky and trees than a yellow filter. The effect of the red filter (very dark or even black sky) is generally too dramatic for most situations.

Each filter has a "factor" which refers to the length of time the exposure must be increased to compensate for the light loss through that filter. If light conditions require an exposure of 1/50 at the given aperture then the same picture taken through a filter with a factor of 2 would require 1/25.

There is, however, a qualification to this operation of filter factor which should receive wider attention. With a light filter having a factor of 1.5 or 2 (such as the light yellow sky filters) it is quite possible to maintain a normal exposure even though the filter is in

use. The latitude of the film will adjust the appearance of the subject to the slight under-exposure while this under-exposure will serve to increase the depth of sky tone for which the filter was used in the first place. It is also possible, if we attempt any compensation at all with such a filter to overcompensate and eliminate the effect of the filter entirely.

These are some concluding thoughts which might serve to guide the first days with a camera into more days of creative pleasure and self-expression:

1. Develop a routine for adjusting the focus, shutter, and aperture before every exposure until it becomes habitual. One man suggests saying FLASH: Focus, Lighting, Aperture, Shutter, Horse Sense.

2. Give as much attention to background as to a subject and foreground. Avoid as much as possible all divided tonal areas and confusing, "busy" detail.

3. For all subjects where motion is occurring or is likely to occur set shutter speed first and let this determine the proper aperture for the light available. For all subjects which remain motionless and thus make shutter speed optional let the depth of focus requirements determine the proper aperture and then regulate the shutter to compensate for the light. Where neither depth of field or subject motion is of any consequence, it makes very little difference which combination of shutter and aperture is used to control the light except for the admonition that no hand-held camera should ever be exposed at less than 1/50 while 1/100 is even better. A good practice is to keep the shutter at 1/100 wherever possible and adjust for all light variations with aperture.

Chapter 34

YOU AND YOUR MOVING PICTURES

JAMES E. McELDOWNEY[1]

THERE may be those who can make better pictures than the amateur but when a screen is flooded with colour or black and white movies and you announce that they are your own—the chest rises with pride and the experience of elation is wonderful indeed.

Now there are various types of moving pictures. Some record family affairs, some report local happenings to an interested group far away. Others are more serious—for educational or promotional purposes. Each type calls for a different approach and technique but there are certain essential facts which are important to all. In what follows I have attempted to share certain hints which have been handed to me during the years. By turning to the paragraph dealing with your particular problem you may find answers which will help to make picture taking an elation to you.

1. *TYPES OF MOVING PICTURES.* There are two main types of film used by Amateurs, the 8 mm. and the 16 mm. 8 mm. is much cheaper to use. Cameras and equipment as well as film are cheaper and now it is possible to add a sound stripe for magnetic recording. It seems the answer to many prayers. Yet there are few serious amateurs who, for long, are content with 8 mm. film. Its chief limitation is that the pictures cannot be enlarged sufficiently to project well for more than a large family or small Church group. When pictures are enlarged more than a certain amount they become fuzzy and appear out of focus. If one is interested only in simple, home movies, he should seriously consider 8 mm. film.

Many start with 8 mm. and change over to 16 mm. later. Often this is in response to a demand that the movie maker produce films for a larger group or for deputation work. This change-over is often very expensive so many begin with 16 mm. from the start.

16 mm. equipment is relatively expensive for those who are dependent on the family purse. However, its use in publicity is

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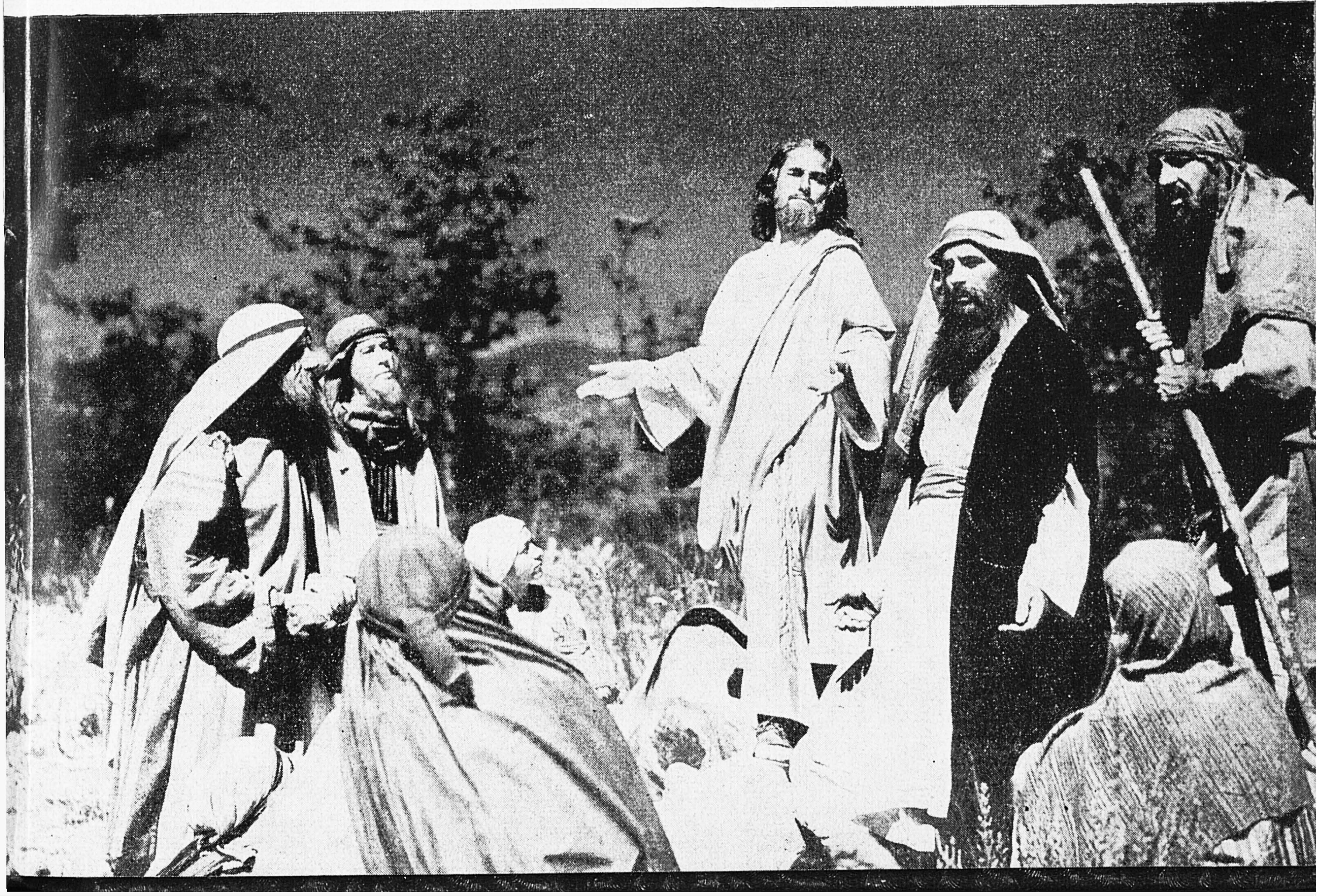
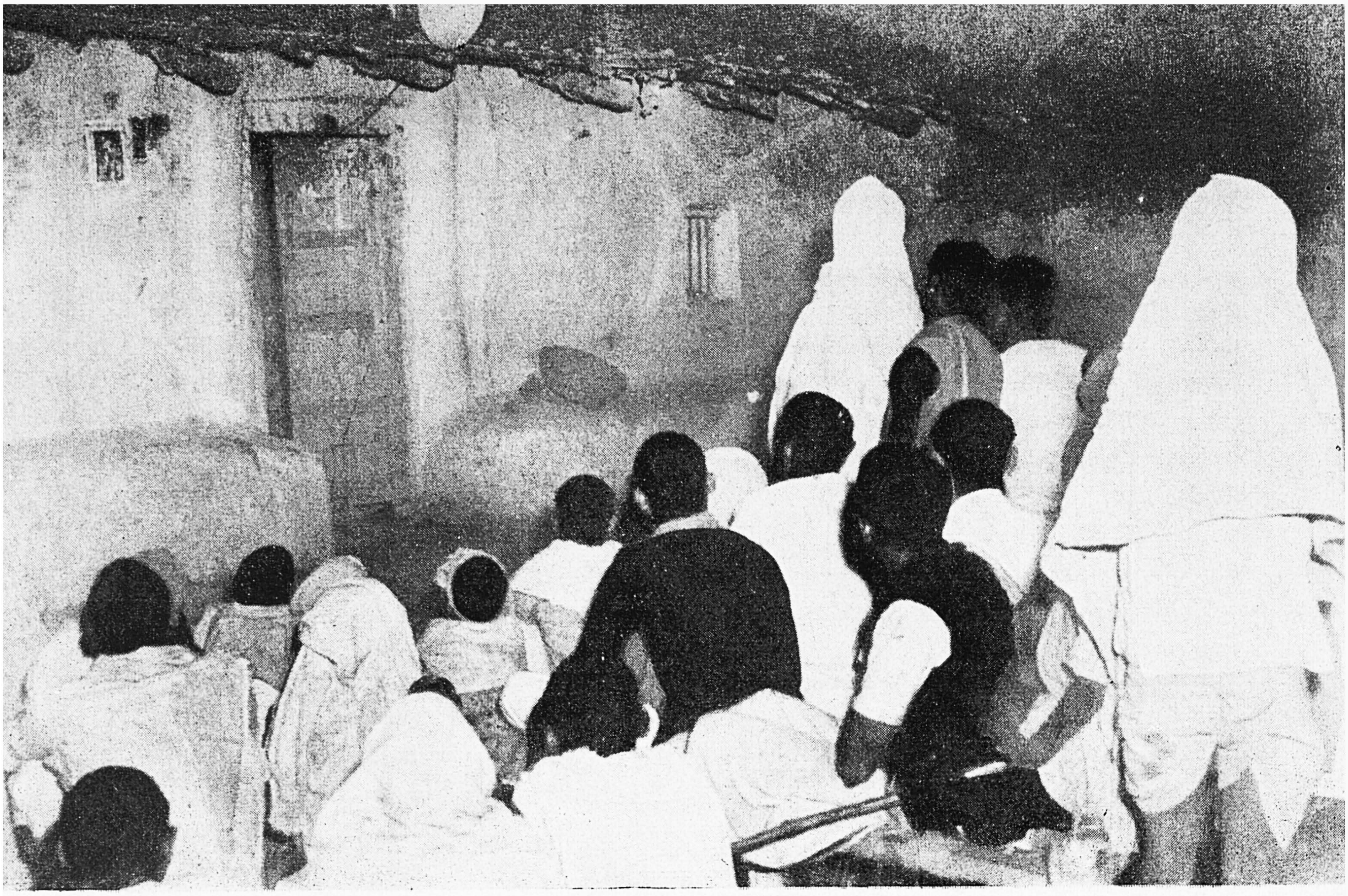
A Cathedral Films Production, "A Woman to Remember".

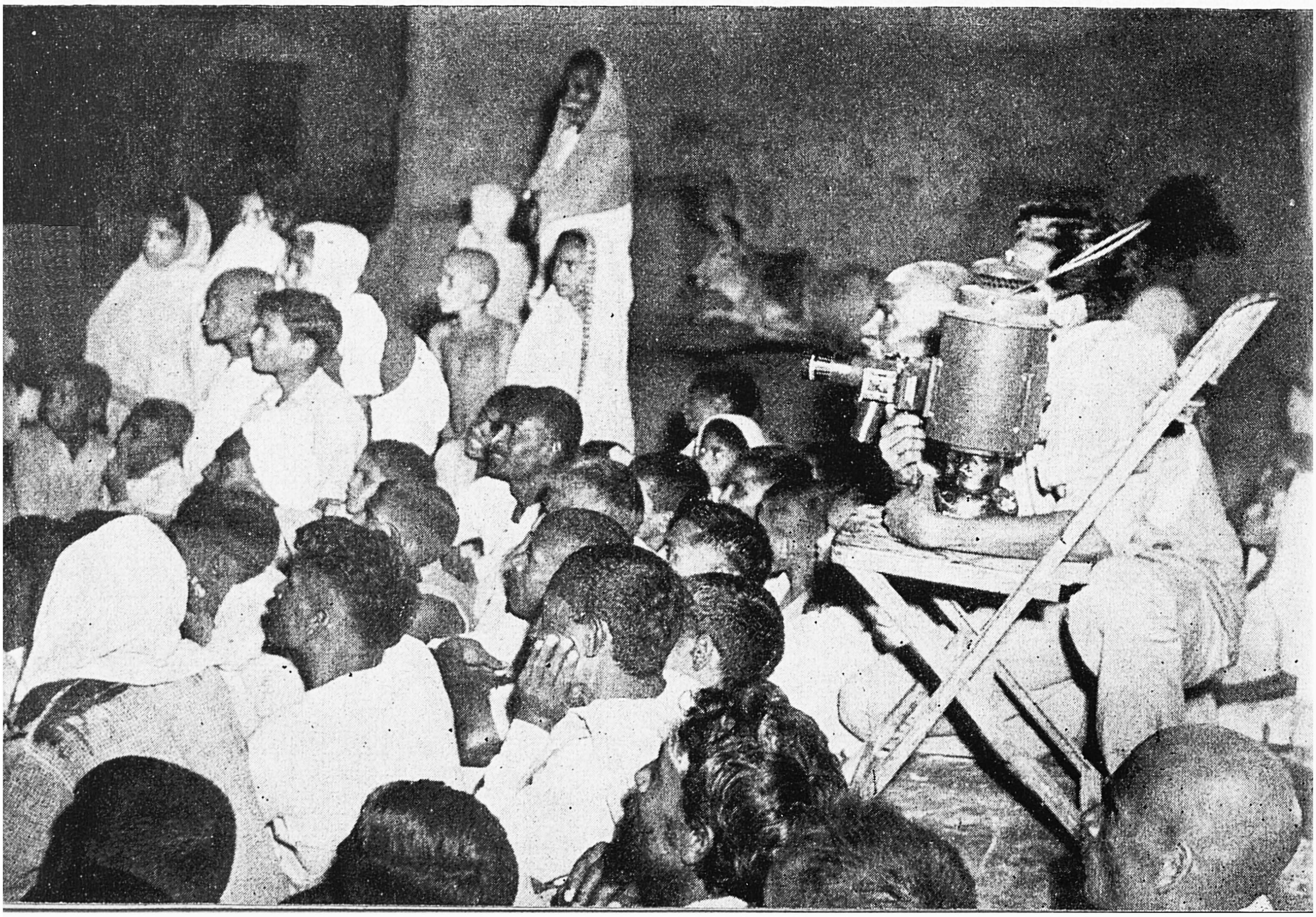
A Church-Craft Production "Jesus' Miracles in Galilee".





Villagers listening to a radio programme from a community listening set. The loudspeaker is kept on the roof of the house and the radio is kept inside.

A *Gaon Sathi* (village worker) projecting a filmstrip with an S.V.E. International kerosene operated projector.



often so profitable that a good deputation film usually pays for itself and the equipment within a relatively short time, if properly used.

Silent and Sound Films. The new magnetic stripe has been developed for both the 8 mm. and 16 mm. films. It applies the same principle used in the tape recorder to films with the result that not one but a number of different commentaries may be made successively on the same film. It has been more widely accepted in the 16 mm. media than in the 8 mm. It is the only successful media for making home sound films. To take silent films and later supply an optical sound track in a studio is too expensive to be seriously considered except for films which will have extensive showing.

We have used the term—optical sound track. This is the earlier manner of producing sound on a 16 mm. film. (It has not been available in the 8 mm. field.) It is still the accepted professional sound on most 16 mm. films. Some observations about the techniques involved in making 16 mm. optical sound will be made later. All sound projectors including most magnetic sound stripe projectors, are fitted with optical equipment.

2. *THE PURPOSE OF THE FILM.* When a family wants a record film for its own use, one of the proud parents presses the button and winds off the film. For certain semi-public films the same will be true—with a little more experience and considerable more work. But if the film must serve a rather large public it may be best to call in more serious amateurs in planning and executing the film. For rare good films this may require professional camera men. In exceptional cases they will make the picture on 35 mm. film and the studio will reduce it to 16 mm.

3. *THE CAMERA.* Today there are excellent cameras in both the 8 mm. and 16 mm. field. Almost every manufacturer has a relatively inexpensive fixed focus model as well as cameras which can do close to a professional job. The fixed focus cameras are those which photograph everything from six or eight feet to infinity (extreme distance) in focus. Unless the camera has a special attachment for portraits, close-up pictures cannot be made. Usually the lense has an opening of about f2.7 which is relatively fast. Within the area for which the camera is made it will do a fine job, provided all other factors are carefully considered.

Interchangeable lenses. The other group of cameras have focusing lenses and the more expensive have interchangeable lenses. In addition to the regular lense (often an fl. 9), there are wide angle and telephoto lenses available. Wide angle lenses enable one to film a larger area at close range. Telephoto lenses bring objects closer and magnify according to the length of the lens. The wide angle and regular lens are most useful while the telephoto lenses are used rarely and are an expensive investment.

Turret Cameras. Many 8 mm. and 16 mm. cameras are fitted with turrets which hold two or three lenses. With a quick turn of the turret one can shift for example from a wide angle to a normal lens. Most cameras with turrets require the removal of telephoto lenses before wide-angle lenses can be used. The Kodak Special is so constructed that it will accept the maximum interchange of lenses. This feature is found only in the more expensive cameras.

Magazine or spool cameras. 8 mm. film is packed in rolls 25 foot in length. After the 25 foot is taken the roll is turned over and on the second run through the camera the other half of the same film is exposed. In processing, the film is split down the center and connected making 50 foot of film. This has approximately the same number of frames (single pictures) as is on 100 ft. of 16 mm. film.

16 mm. film comes either in magazines or in rolls. Rolls may be 50 feet or 100 ft. in length. Film packed in magazines are considerably more expensive and often more difficult to procure. The advantage of using magazines is that one may expose a short footage of one type film, for example, Kodachrome film, and after closing the magazine, replace it with black and white film. If one uses rolls of film it is difficult to change a roll until the entire length is exposed without danger of losing a certain footage. The lower cost makes film packed in rolls attractive. Cameras are made for either the one type or the other and not for both.

Cameras with Special Features. Certain more expensive cameras, like the Kodak Special and certain Bolex models, have many features making possible single frame exposures, rewinding the film for fade-outs or fade-ins, double exposures, etc.

Usually these are not used by the more professional workers because such effects are obtained in the laboratory during the editing and final printing process. It is hoped that there will be laboratories doing this work for 16 mm. films in India in due time. At present it is necessary to have the pictures enlarged to 35 mm. size, in which the special effects are produced and the resultant picture is again reduced to 16 mm. Of course this can be done only in black and white film because there is too great a loss in colour rendition by such a process. Because of the lack of laboratories doing this special feature work, cameras with attachments capable of double exposures have certain advantages, especially in making titles.

Familiarity with the Camera. There are booklets supplied with every camera telling how to load film, set the lenses and operate the camera. These must be studied carefully until every detail is well understood. If someone can supply a length of old film it would be well to practise loading and unloading on the old film and it would be helpful to run short lengths of film through the camera taking imaginary pictures, following instructions for holding the camera

and viewing through the view-finder. The instruction books are essential reading material for every camera owner.

4. *TRIPODS.* The amateur likes to hold a moving picture camera in his hand and feel the motor hum. He likes the freedom of a hand-held camera which he can move without making the picture blurred. Those who see the results may not appreciate the movement of the camera. Moving pictures should record movement in the object of interest and not in the camera. The more steady the camera is held the more pleasing will be the result. For most people this means a tripod and if the camera is relatively heavy the tripod should be very sturdy.

There are many types of tripods. Many are made of light metal like the Quickset. They are moderately steady. The Professional Junior is steady but its cost is prohibitive for all except advanced amateurs.

The Tripod Head. The second most important part of the tripod is the head. The head should be so built that it will permit tilting up and down as well as free movement from side to side. It should be so built that it can be taken apart to remove dust and sand. A tripod head which results in a jerky following of fast action is distressing.

The extension of a tripod to its full height quickly and firmly is a third consideration. Many tripods use bakelite clamps inside the turning unit to adjust the length of the legs. This composition material is satisfactory during dry weather but in a rainy, humid climate the bakelite clamps soon swell and may make movement entirely impossible. Metal clamps are best.

Tripod elevators or screw devices which lift the camera without necessitating the extension of the legs sound good but in fact the higher the camera is elevated the more movement there is in the camera. Many who have elevators to use them sparingly but extend the legs to the desired height so that the camera will remain steady.

Speed of the camera. Many, cameras have adjustments which regulate the speed the film passes the aperture or exposure frame. In making a silent film in 16 mm., sixteen frames are exposed per second. Film to be used in a sound film (except for magnetic stripe) should be 24 frames per second. Less than 16 frames per second results in what looks like very rapid action when it is projected at regular speed and more than 24 frames it projects as slow motion pictures. In changing camera speeds one must also make compensating changes in exposure time. Eight frames a second will permit taking pictures in unfavourable light, provided the action is very slow and deliberate so that it will appear normal when it runs through the projector at twice the speed used in taking it. Faster speeds require more light and are for special effects.

Length of each shot. The amateur is inclined to take very short lengths of film. It is wise to take sufficient film to show the significant point of the action or to permit familiarity with the scene before the scene shifts. It is wise to take an establishing shot of some eight to twelve feet, according to the subject, then move into a medium shot which will give more detail for six to ten feet and include close-up shots of the center of attention. These close-ups may be brief, but it is always best to get sufficient of these so that they can be spliced into the final film and replace some of the less interesting more distant shots. This may require a repetition of the action two or three times following as nearly the same action and location as is possible. When one is filming something which cannot be controlled he will still change the distance, possibly by using different lenses from the same location if possible. He will not attempt to take shots in the order they will appear or the final film, except in the case of an action which cannot be repeated, but will take whatever length he needs in one location or with the same characters at one time and splice them together in their proper order after the film has been processed. Amateurs err on the side of too few rather than too many close-ups.

Footage length of shots. Every camera has its spring wound motor which moves the film forward and produces the moving characteristic of the picture. Some cameras have springs capable of advancing ten foot of film, others greater lengths to a maximum of about thirty feet. This feature is very important in the choice of a camera for one must have a reasonable strong spring motor. It is furthermore most important to remember to wind the spring between shots so that at all times during the taking of film the motor will be at its maximum strength. Failure to do this may result in the stopping of the film in the midst of important action.

Loading and Unloading the Camera. Film is received from the manufacturer ready for insertion into the camera. Instructions for loading the film will be found in the Camera instruction booklet. Except for magazine loading, the camera should be loaded in the shade and the film supply should never be in direct sunlight.

The Instruction booklet will give advice on how best to hold the camera or a tripod should be used. After the film has been exposed, it should be removed and repacked in the containers (in semi-darkness), and sent for processing at either the manufacturer or at another reliable concern. Kodak films include the cost of processing in the original purchase price. Others follow different practices.

Once the film is opened and put in the camera, it should not be kept for long before the processing is done. This is especially true of colour film and more true during the damp season than at any other period of the year.

5. *PANNING.* In speaking of camera movement a further word

is necessary. It is most desirable that the camera remain still and that the film record action in the center of interest. If possible the camera should be so placed for longer shots that the field of action can be observed without moving the camera. At times, however it is highly desirable to follow action with the camera. Following such action is called panning and is to be done only seldom. The steadier the movement of the camera the better the result. It is entirely incorrect to suppose that the camera is something like a machine gun moving swiftly to mow down good pictures in widely scattered points of the scene. Panning should be an exception rather than the rule.

6. *EDITING AND SPLICING THE FILM. Handling the film.* As soon as the film is returned from processing there is excitement to see what it looks like. Sometimes it is held before a strong light to view separate frames. This is not the best procedure but if it is done, certain precautions should be observed. Place a basket on the floor and cover it with a lintless cloth. Push the cloth down to receive the film inside the basket. As the film is drawn from the spool, touch only the edges. Never permit the fingers to contact the picture area of the film. It is best to wear white cotton gloves at all times when handling the film.

When rewinding the film care must be taken not to wind the film loosely and then draw it tight. This scratches the film and may do real damage.

Original and copies of the film. If the film is to be used extensively or many copies made then it is best to have a work print made in a laboratory before the film is ever run through a projector and the original film is put aside. The work print is then edited and seen through the projector as many times as is necessary during editing. When the work print is satisfactory, the original film is edited to correspond with the work print.

Editing Equipment. Splicer. The one fundamental unit needed is a splicer. Kodak makes an inexpensive splicer which is usable on small jobs. Careful directions are given with the splicer and must be followed implicitly. There are three different types of splicers, the dry splicer, the wet splicer and the hot splicer. The dry splicer, such as the Craig, uses a file-like metal fixed on a sliding rod to clean the emulsion off of the film. Experience results in fairly satisfactory splices. The wet splicer, such as the simple Kodak splicer, calls for a brush of water on the emulsion and the removal of the emulsion with a scraper of some kind. The hot splicer is for professionals because of its high cost. Bell and Howell make one of the best. With this the emulsion is scraped dry, but the cement is dried under heat.

Splicing film. Films are made up of film base, which has more of a shine, and film emulsion—the dull side of the film. The emulsion is only a fraction of the thickness of the film base. Film cement will not make emulsion or film base adhere to emulsion, only film base may be cemented to film base. To do this one must remove a strip of emulsion. By turning up the emulsion side of the film, the emulsion is scraped from the left-hand strip of film. As the film in the right hand, properly trimmed, is brought over the scraped film, the underside of the film (film base) will adhere to the film base from which the emulsion has been scraped. Experience teaches that one must not use too much cement, nor too little. Nor must the brush extend beyond the scraped portion or it will leave a smudge on the film. Once the two surfaces are pressed together (usually in a splicing machine) they will adhere within twenty seconds. In fact, good cement makes one section of film dissolve into the other. To leave a splice in a machine longer than forty seconds will result in shrinkage of the film causing poor splices.

Film Cement. One should keep most of the film cement shut up tightly and take out only sufficient for the particular job at hand. It is wise to use a special bottle for this supply—a bottle with a brush fixed to the stopper. As the brush is lifted out of the bottle it should be touched to the side of the container to remove excess cement. Between each splice, the bottle should be made tight so that the cement will not evaporate and lose its strength. If it does fail to adhere, cut fine strips of film and drop them into the cement. After a few hours, the cement should be revived sufficiently to adhere. Sometimes during wet weather it is difficult to get splices to adhere. Wet splices are most difficult. In that season it is better to use dry splices and if the film can be kept in a dry area such as close enough to the kitchen fire to be in dry air without being in more than moderate heat, the film will remain dry enough to work on.

The Griswold is one of the best splicers for it has a space on each side of the pressure area in which the film does not touch metal. If the splicer is only a flat metal fitted with notches to hold the film, when the pressure plate is closed to force the two sections of film together, the cement tends to spread along the film. In the Griswold that is avoided. The scraper for the Griswold is extremely accurate and does not scrape off more emulsion than is necessary. Professional editors often use either emery paper (regular emery sticks used for finger-nails) or steel finger-nail files instead of scrapers, to remove the emulsion. After a little experience splicing is made much easier with these simple tools.

Viewer. If one is to do more than a little moving picture work he will need a viewer to see the film as he edits it. Kodak makes a moderately priced one. The image is sharp although very small.

Craig and B & H. make larger screens or viewing areas although the pictures are often not as sharp. With the aid of a good viewer one may determine the exact frame he should cut.

Winding arms. One may use the projector in editing. The arms of the projector may be used to hold the spool of film. This is generally inconvenient. Simple rewind arms which will accommodate a 400, 1,200 or 1,600 ft. reel are available. These are useful not only in editing to hold reels of processed film but may be used to rewind film after showings, saving the projector.

Handling the film. When doing a serious job, whether of the family or making a promotional film it is best to write the story carefully, then break it up into a shooting script giving numbers to each major shot. After the film has been processed each shot is identified and a number attached. Some use clamp clothes pins to hold tiny bits of paper bearing the number of the shot to the film. Paper clips can be used, or number slips may be attached with a small piece of scotch tape.

As the film is cut and labelled, the sections may either be hung on a frame made for the purpose, beneath which is a cloth-lined basket or other receptacle of soft material to hold the dangling film. Or sometimes only a basket is used with the film dropped into the basket and only the numbered ends hanging over the edge. As far as possible the film is arranged serially around the top of the receptacle so that in editing the lengths of film belonging to the same part of the story are located next to each other. Blurred, badly over-exposed film, or other spoiled film may be thrown away at once but it is best to keep all usable film even though it is a duplicate, until the final editing is over.

After the film has been cut apart, and if it is not possible to edit the film at one siting, it is advisable to roll the separate shots into small rolls and faster them along with the label with a short length of scotch tape. These should be kept in a dust proof can or other container, until editing can be resumed.

Careful editing improves movie making greatly. Discard all poorly exposed sections, unless they have sentimental value. Such sections should not be shown publicly. The more care one exercises in taking the picture, the less film must be discarded on the editing table, but to discard questionable film is advisable.

Titles. Every good book on movie making will have a section on titles. The subject is too broad for more than passing reference here. Titles which are clear, striking and original without being peculiar are best.

When your picture is edited you should add four to six feet at each end as a trailer. This protects your film. The trailer may be purchased from the photographic dealer.

7. *SOUND FILMS.* Magnetic stripe film is now on the market. Full instructions are received with the projectors which use that type film. The optical recording process is entirely different. One must secure the services of a sound studio whose technicians will provide full information regarding the process. If both dialogue and background music are to be used, the studio must be engaged for separate recordings on films of both these sound effects. These, then, are carefully synchronized with the picture so that exactly the proper effect is attained. These two separate stripes are then married to form the single stripe and this in turn is copied on to the final film. In the final process the married sound stripe is copied simultaneously with the picture, resulting in a single film bearing copies of both the sound track and picture. This requires a length of sound film for each process in addition to rather high fees for laboratory and technicians. Except for semi-professional work, it is too expensive for most amateurs.

8. *THE MEASUREMENT OF LIGHT* Good moving pictures depend very largely on good lighting. If the movie is being made in a situation which the photographer can control the following suggestions will prove helpful.

Contrast. Flesh tones appear darker when filmed against backgrounds of white. Clothing should be light blue or pastel shades and never white for the best results. Color film should be taken in direct sun light, an hour after sunrise and not later than an hour before sunset. Pictures taken between 11 and 1.30 in the middle of the day will have strong shadows which are not desirable.

Reflectors. Ply-board covered with dull foil will reflect a diffused light in shadow areas. Even when the pictures are taken in sunlight, it may be best to use those reflectors as fill-in lights. They are difficult to use with a large group but for a small group a number of hand-held reflectors will be useful.

Artificial light. Type A. Kodachrome and other special film for use with artificial light make indoor pictures possible. The light source should be 32,000° Kelvin. For very restricted areas the photoflood bulbs available in most photography shops used with reflectors, will prove adequate. Sufficient light, not only for the subjects being photographed, but to flood the background so that there will not be unwelcome shadows, must be arranged. The use of such equipment requires special study.

Measuring light. There are light charts prepared for general use in determining camera settings for most situations. These may be used with considerable success although serious work requires a light meter. Normally the eye adjusts itself to light intensity so well that it is not a good objective measuring instrument. There are many light meters available to do this work automatically. A good

light meter will not only measure brilliant light but is also adjustable to measure weak light sources. Its use is advised. Detailed instructions are furnished with most light meters, such as the General Electric. Such instructions should be read carefully. Each operator must learn to use his tools intelligently.

9. *CONCLUSIONS.* Beauty surrounds us. Growth and development captured in film are precious records of family and friends. Pictures open up new vistas of experience and acquaint us with new area of knowledge. To help create such pictures becomes a challenge and joy for those who are willing to enter seriously into a stimulating adventure.

Chapter 35

PROBLEMS OF PHOTOGRAPHY IN THE TROPICS

H. R. FERGER[1]

THE photographer who comes to the tropics for the first time meets certain problems in his work which will be entirely new to him. Of these the most important of all and perhaps the most common, especially at certain seasons of the year, is DAMPNESS or humidity. Others are salt air, dust, heat, fungus on lenses and the problem of correct exposure.

DAMPNESS

Let us deal with dampness first as this is the basic cause of at least one of the others mentioned above, fungus on lenses. In North India it is the monsoon season with which we are concerned. All of us have had experience with the film in a camera which has been left half exposed out in the open or in an ordinary drawer for several weeks (or less) when the air is reeking with humidity. The film possibly sticks and cannot be further wound. And when it is sent for development it is covered with spots or completely ruined.

It is best, during the period of excessive humidity, so far as possible to avoid photography of all sorts, including the taking of pictures, development of film and printing of pictures. All apparatus (especially lenses), film and paper should be kept in air-tight containers or otherwise protected from the moisture. But one needs to know what precautions to take if one cannot stop work entirely.

AIR-TIGHT BOX

It is necessary to provide first of all a container as air-tight as possible, adequate in size for one's apparatus, film and paper.

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[1] Rev. H. R. Ferger, B.D., M.A., Jumna, Allahabad, has been loaned by the Synodical Board of the North India American Presbyterian Mission and the Presbyterian Board of Foreign Missions in the U.S.A., to be the Field Director for North India of the Audio-Visual Aid Committee of the National Christian Council. He is a pioneer in visual aids, a noted photographer and skilled cinephotographer.

I have found a tin trunk to be excellent, if the cover fits fairly closely. A larger tin-lined box can be prepared. Of course any film or paper in tropical packing need not be placed in this. It will be well to keep all projection apparatus such as movie or still projectors (at least their lenses) inside the same or a similar box. If this has a stout hasp and lock, so much the better!

In my home at Allahabad I have a large, steel almirah (Indian made, Godrej) in which I keep my projectors, cameras etc. In our office I have a large, tin-lined box in which I keep spare photographic paper and films, also the lenses from all projectors when not in use. In the photographic laboratory is another steel almirah for my collection of negatives (all carefully filed), paper in use, lenses from the enlargers and the like.

DRY RICE

A dehydrating agent is also necessary. There are several such on the market, such as silica gel, which changes its colour when it absorbs moisture and thus shows the need for reheating to expel this. But I have found ordinary bazaar rice just as effective and far cheaper. Dried tea leaves (so I have read) can also be used, and even ordinary brown wrapping paper.

For a small box, get a pound or so of any cheap variety of rice. Put into a deep pan (degchie) inside an oven or on top of a stove (stirring constantly) till it is thoroughly dried. Some grains should begin to turn slightly brown. Put on the cover and allow it to cool. Fill the rice loosely into one or several small bags and tie shut their mouths. Such dried rice is an excellent dessicating agent, in the same way as our grandmothers used to put a few grains of rice into a salt shaker. Put such bags of rice in the box with the photographic equipment. It has no smell and no harm can come from spilling or the absorption of moisture. The rice must be reheated from time to time during the monsoon, depending how air-tight the box is, and how often it is opened. I have found that about once a month is usually sufficient though in the large almirah, often opened each day, this is done each week. The same rice can be used for several years—perhaps indefinitely. One can even learn to tell by the feel of the rice when it has absorbed moisture and needs to be dried out. If in doubt, heat it again!

A camera and films can be taken from such a box for several hours during use and replaced. In travel, one can use a small biscuit tin for a small camera and spare films or put a smaller bag of rice inside the camera case.

EQUIPMENT

Such a box should be used to protect lenses of cameras, projectors, enlargers, opera glasses and the like from fungus growth (often called

mould or mildew) which is so common in damp, tropical climates. When such an affected lens is held so that light comes through it, and turned backward and forward slightly, one can easily see the fern-like growth, either along the edge or (less commonly) in the middle. This is a living, fungus growth, and unless checked promptly, will in time completely ruin the lens. This may be only on the front or the back surface of the lens, or even inside the lens, on one of the inner surfaces. (A good quality lens will have from 2 to 4 components, with 4 to 8 surfaces.) How this fungus growth travels, no one knows, but probably by spores through the air.

FUNGUS

This fungus seems to secrete some sort of acid which actually eats the soft glass and in time etches the pattern into the surface. It is clear that this grows and multiplies better in the damp weather —therefore keep at least your lenses in such a drying box as described above for at least that period, and examine them periodically.

What is to be done for lenses that have such a fungus growth? If caught in time, the growth can be entirely removed with but little if any permanent damage to the lens. Use a tiny amount of lens cleaning solution (available from Kodak Ltd. for Re. 1), on a clean soft handkerchief or lens tissue, then polishing with the same. Ethyl alcohol (not methylated spirits) can also be used. Avoid too much solution, and especially avoid getting it on the edge of the lens where it would dissolve the cement holding the compound lens together. If the growth is on one of the inner surfaces, the lens must be unscrewed into the component parts. This requires careful work and is not a job for an inexperienced person. Special care must be taken to put the parts together again in the same way.

In extreme cases where the growth has gone on for many months and the etching is deep, the lens must be sent to an expert optician for repolishing, such as Lawrence and Mayo in Bombay. It would be well to ask them for a quotation of the cost before authorising the work to be done.

Never moisten any lens with saliva to clean it. This seems to be a specially favourable medium for the growth of this fungus. It is however quite proper to breathe on a lens so that the water vapour condenses on a glass surface. Before rubbing any lens, great care should be taken to dust off all dust or particles of dirt on it. Use a lens brush or fine camel hair brush.

Exposed and developed Kodachrome slides and film should also be kept in a dry box or almirah (as above). I have taken no special precautions in the past and have had but little trouble. However several of my recent slides, only a year old, showed distinct signs of

fading. I sent these to Kodak Ltd. for examination. They reported that this had been caused by fungus growth, which could be stopped with Kodak Film Cleaner. The old mounts should be discarded as they would doubtless be full of fungus spores. They sent me a four-page leaflet on "Prevention and Removal of Fungus Growth on Processed Photographic Film". This states that all film (unexposed as well as processed) should be stored in an atmosphere with a relative humidity of 40 to 50 per cent, but never over 60 per cent.

Relative humidity can be lowered by raising the temperature. Thus cameras, projectors and equipment (never film!) can be kept in a heated storage cabinet when not in use. The temperature should be around 110°F and should never exceed 115° The easiest way to arrange such heat is to allow an electric bulb on an extension cord to burn inside day and night. The required power of the bulb should be found by experiment, depending on the size, etc. of the box or almirah. In a large cabinet several bulbs may be required. I have seen at least one such arrangement in India, at Mount Hermon School some years ago.

The dry heat of the tropics will not particularly harm photographic apparatus, except older cameras which are made largely of wood. The heat and extreme dryness often cause the wooden joints of such to contract and become loose. Heat is not good for sensitive film and paper, even if tropically packed. It is best to keep this in a refrigerator if possible, both before and especially after exposure, provided it is in air-tight containers. Unexposed film should be taken out 24 hours before use so that it may come to room temperature. Otherwise in a damp climate, moisture will condense on the cold film, thus ruining it.

DARKROOM PROBLEMS

In developing negatives in the hot weather, some sort of temperature control must be used. Temperatures of all solutions should be as near the same as each other as possible. The developing and fixing tray (also the stop bath, if one is used) can be set in a larger tray with water and some lumps of ice in it. (Never put ice into the solutions themselves.) Check with a thermometer. Wash water is also cooled with ice. With the use of special formulas, development of film CAN be done at temperatures as high as 110 degrees. See the pamphlet on "Tropical Development" by Kodak Ltd. This has much other useful information for the tropics.

If films have been properly fixed and all the hypo washed out, they will keep indefinitely with normal care. However if even a trace of hypo remains, the films will absorb moisture in the monsoon and will soon begin to turn brown and stick together or to the envelopes in which they are stored. In case of trouble of this sort, wash them

again (try first with one film to find out if the whole emulsion will dissolve or not). And keep them in a drying box as above.

SALT AIR

Salt air is the problem of dampness, plus the corrosive action of the salt. All metal parts of a camera, etc., need to be protected by wiping a thin layer of good oil or vaseline on the metal from time to time. Use a good leather dressing on the leather. Even more important of course, on a vessel or close to the ocean is to avoid exposure of apparatus to such a hazard just as much as possible. Prevention is always easier than cure.

DUST

To protect against dust, of course preventive measures so far as possible are the best: avoid exposure so far as possible. Keep all apparatus shut up except at the time of actual use. Dust off the lens of a camera each day with a camel's hair brush. Clean all apparatus, including the back side of the lens, regularly. It is amazing the amount of fine dust that will accumulate inside the bellows of a camera even if not used. And remember the power of static electricity to attract dust during the dry season, especially in the winter. Be especially careful not to generate electricity on the surface of a movie film as you load the camera. Even the leader can attract a great amount of dust and this will be caught in the camera gate. Be eternally vigilant for dust.

EXPOSURE PROBLEMS

The correct exposure in the tropics is often very puzzling. The light and the glare often seem much more intense than where you have come from, yet at times more exposure rather than less is necessary. The usual explanation given is that there is less diffusion of light from dust particles and moisture in the air so that the shadows are more dense, therefore somewhat greater exposure is required. It is best to constantly keep a record of lighting conditions, time of day, of the lens opening and the like, and learn by experience. I consider an exposure meter almost essential to any photographer especially with colour film, unless he always works only outdoors in direct sunlight near the middle of the day. When clouds obscure the sun, partly or wholly, and under abnormal conditions. the human eye simply cannot correctly estimate the real intensity of the light. And of course you must come to know your own exposure meter, learning just what factor for a given film gives you the best results. Always use your exposure meter with a reasonable amount of judgement and plenty of commonsense.

In the summer season when the sun is nearly over head, there are always deep shadows under the eyes during the middle of the day. Therefore in that season it is best not to attempt *close ups* of people in the sun during the middle of the day. This applies both to colour and black and white photography, movie and stills. Use reflectors to lighten the shadows, or get the person in the shadow of a building.

For more information, obtain the 16-page pamphlet of "Notes on Tropical Photography" from Kodak, Ltd. (Box 343, Bombay 1) and the four-page pamphlet on "Prevention and Removal of Fungus Growth on Processed Photographic Film" from the same source.

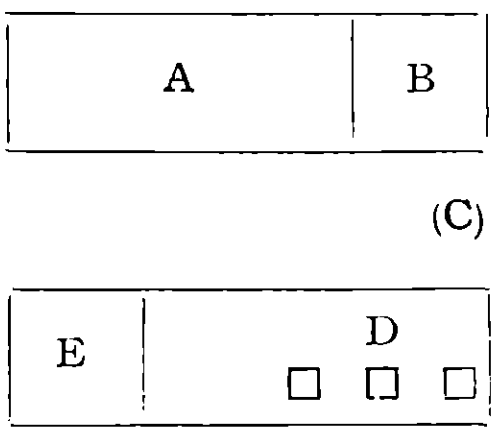
Chapter 36

PHOTOGRAPHIC PROCESSING IN RURAL INDIA

KENNETH E. WEIGEL[1]

IF you think you must have a place in the city with electricity, running water, and a thousand other expensive gadgets before you can develop and print your own pictures—don't believe it! It is the purpose of this chapter to give you enough information so you can do it even in the uttermost parts of the world, wherever preaching the Gospel may take you. This does not mean that all will be rosy but it is hoped that the information given here will be a boost in that direction. All but a few of the chemicals mentioned should be found in any bazaar that boasts of one competent photographer. No attempt has been made to discuss details that are bound to vary with each individual. To those who are blessed with film tanks, auto-focusing enlargers, voltage controlled timing devices, and the like, we have no advice except to read the directions that come with them. If the general idea is clear enough to help national workers with limited means to develop and contact print their own pictures one goal will have been made. The other goal is to help those who feel the need to make enlarged photographs of high quality. The paragraphs have been numbered for easy cross reference.

2. There is more to a darkroom than keeping the light out. It is a specialized laboratory. Almost any room can be used at night. Cramped quarters should be avoided but a compact arrangement makes working easier. Figure 1 shows an ideal set-up. This principle can be adapted to any available space of about 7 x 9 feet. A sufficient area should be allotted for a paper cutter, and the handling of negatives and printing paper. See (A). The printer or enlarger should be nearby (B). A light, tight drawer in the table under the enlarger is handy for paper



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that is being used and to stack duplicates so they can be developed together. The trays for processing solutions (D) should be far enough away so that stray splashes will not fall on the enlarger or other equipment. When much work is to be done a stool (C) has well-known advantages. If drying is to be done in the darkroom racks can be made beneath the bench (E). Drawers in the tables and shelves above them make for convenient storage. Used chemicals and wash water should be drained well away from the building through a rubber hose to prevent damage. Many chemicals leave ugly stains. Hypo softens the cement so that the water can wash it away. In the absence of a proper drain waste chemicals should be carried away in a bucket. The chemicals do not seem to harm plants.

3. To develop film or small prints three trays or dishes that hold at least 8 ounces of solution are needed. Metal containers other than stainless steel should not be used unless they are enamelled. Trays of rubber, plastic, china, etc., are all right. The first tray is for developer, the second for rinse, and the third for fixer. Film clips or spring clothes pins are used to hang film but it is possible to get along without them. A towel or two is indispensable.

4. Safe-lights can be made by dye coating the chimney of a kerosene lamp. The small wall type lamp with the 3/16th inch round wick common in all bazaars is good. Several chimneys can be coated different colours for various needs. The air vents should be shielded in such a way that the stray light from them will be kept from sensitized materials and not stop the flow of air. The light going straight up will do no damage if the light is set on a stand a few feet higher than the working area. A lantern is better yet but still needs to be shielded on one side.

The dye coating formula follows:

Dye Coating for Glass

SOLUTION A

Water ...	10 ozs.
Granulated cooking gelatin ...	1 oz. (10 level tea-spoonsful).

Allow to soak for fifteen minutes. In the meantime prepare B & C.

SOLUTION B

Water	1 oz.
Potassium chrome alum	20 grains (or $\frac{1}{4}$ teaspoonful crushed).

SOLUTION C

Water	5 ozs.
Yellow butter colouring (dry)	3 level teaspoonsful.

Heat A stirring until the gelatin is dissolved and bring to near boiling. Do not boil. Remove A from fire and add B and then C while stirring. When the solution cools strain through several

thicknesses of cloth. Then the small chimneys can be immersed in it. For larger ones the solution can be poured into a shallow tray or pan and the chimneys revolved in it. Drain well and set on some old paper to dry. Two small parallel sticks placed under the chimney will allow air to pass easily. A short candle placed inside hastens the drying. Six coatings should be applied. The solution will keep for several days and should testings show that the light is too bright it may be given additional coats. If the gelatin sets in cool weather it can be re-heated. By adding one teaspoonful of liquid red food colouring to the yellow coating an orange safe-light for enlarging papers can be made. By adding the full ounce of red food colouring a red safe-light for orthochromatic film can be made.

5. To test these, or any safe-light, put the light in the place where it is to be used. With the flame low place a piece of photographic paper on the work table face up and cover part of it with an opaque object. Expose it for two minutes, then submerge it in the developer for another two minutes. Fix it for one minute before examining it in a bright light. If the paper is white the light is safe. If it is not the light is too bright. Turn the flame lower and test again. If it is still too bright move the light farther away. If these fail several more coats of the dye solution are needed. To test for ortho film simply cut a piece from the end of a film and develop it. Electric bulbs may also be treated in this manner. They will need twice as many coats. Off the record this same system may be applied to Christmas tree lights and other decorations. Should the coating become sticky it can be hardened by immersing it in tropical hardener (19).

6. A large drum, with a good-sized faucet near the bottom, mounted five or six feet above the floor will give enough pressure for running water. In hot weather it is helpful to have it inside but during the monsoon it adds to the dampness. Rain water gathered from the roof after the monsoon is under way can be stored in earthen water pots and used as distilled water. New ones should be varnished or painted to seal them and may be covered with plastic refrigerator dish caps. Even when distilled water is not specified it is good practice to use it for stock solutions.

7. During the long monsoon photographic materials are easily damaged by fungus, mold, or the absorption of moisture from the air.

8. (*a*) All formulas should be mixed in the order in which the chemicals are given.

(*b*) Chemical crystals such as potassium, chrome, alum etc. take a long time to dissolve. When powdered they dissolve quickly. Crush them in the bottom of a cup with a small tough bottle about 1″ in diameter. The bottle should be rested on the chemical then slowly turned with just enough pressure to crumble the crystals.

(*c*) Measuring the proper amounts of chemicals is not too hard without the use of scales if the right proportions are known. The household measuring cup that the cook is supposed to use will do for fluids. For strong acids use glass. For very small amounts a medicine dropper can be used. When all of the air is squeezed out of the rubber bulb the medicine dropper will fill up about half way. This is very close to $\frac{1}{4}$ dram and accurate enough for the formulae used here. 32 of these equal 1 oz. Household measurements are given in parentheses.

(*d*) A level teaspoonful means one that is packed down and levelled with a knife. To get $\frac{1}{2}$ teaspoonful, fill the spoon and put the knife blade down the center lengthwise and push off one-half. To get $\frac{1}{4}$ teaspoonful settle the half in the bowl of the spoon and divide it the same way. Rounded teaspoons are specified for chemicals that are in fairly large crystals and impossible to pack down. Chemicals that are lumpy should be powdered as explained above.

(*e*) Some chemicals contain dirt and grit that are not kind to the tender photographic emulsions. It is wise to filter all chemical formulae before using them. If you do not have regular filtering papers such as your chemist or druggist uses you can get by with a little cotton in the bottom of the funnel. The cotton is not as efficient as the filtering paper but is good enough for most formulae.

(*f*) When adding replenisher (12) put it in the bottle while the developer is still in the tray. Pour in the used developer until the bottle is filled to the quart level and throw what is left away. If you have just developed 3 rolls in D-23 put $2\frac{1}{4}$ ozs. of replenisher in the bottle then pour back the used solution. This keeps the developing time constant.

9. Good negatives make darkroom work a pleasure. The thing that puts pleasure into the negative is good contrast. We contrast such things as love and hate, or black and white in order to observe their differences. The description of a common scene will illustrate photographic contrast. Suppose we have photographed a man in a black coat, wearing a maroon tie, and reading a book. Everything we might mention in the scene is of a different shade or tone regardless of colour. There is a contrast in the flesh tones of the face and the deep colour of the tie, just as in the black of the coat and the white of the pages but the difference is not so great. If in the finished picture the tie and the face appear to be of the same shade of gray the contrast is very poor. If they are represented by light and deep tones of gray the contrast is good and the other tones of the picture will automatically fall in their right places. The white pages and black coat will appear to be as different as they were in the original scene. When all the shades of tone in the scene are accurately represented in the picture we have good contrast. The negative must have fair contrast to make a good photograph. Unless we

use artificial lighting we cannot control the contrast of the scene. By proper development of the negative we can make the contrast of the scene fit the paper. Exceptions are rare. Long development time gives greater contrast; short development time gives lesser contrast. In a contrasty scene, such as a village street on a bright day when shadows cover part of the roadway, a normal exposure will not produce a print that looks like the scene. If the shadows print well the sunny part will print almost white and vice versa. If such a scene is given 2 to 4 times normal exposure and developed 20 to 40 per cent less than normal time a surprisingly good print will result. On the other hand if the day is dull give 50 to 100 per-cent less exposure and develop the film 20 to 40 per cent longer than normal.

10. For those who wish to mix their own developers the following simple formulae are highly recommended:

KODAK D—23

A semi-fine grain developer for all normal work.

Water, about 125°F.	24 ozs.
Elon.	$\frac{1}{4}$ oz. ($2\frac{1}{2}$ teaspoonsful, level)
Sodium sulfite	3 ozs. 145 grs. ($18\frac{3}{4}$ Tsp. level)
Cold water to make	32 ozs.

For tray development (13) average time for most roll film is 15 minutes at 68°F., 8 minutes at 75°F., 6 minutes at 80°F.

Develop 35 mm. Super XX and other high speed 35 mm. film 20% longer.

After the first roll develop each roll 10% longer than the previous one. One quart will develop about 8 rolls of film size 120 or its equivalent.

Up to 25 rolls may be developed if $\frac{3}{4}$th of an ounce of Replenisher DK-25R is added for each roll developed. The developing time should NOT be increased (8f).

KODAK D—25

Fine grain developer for film that may be used up to 90°F.

Water, about 125°F.	24 ozs.
Elon	$\frac{1}{4}$ oz. ($2\frac{1}{2}$ teaspoonsful, level)
Sodium sulfite (dessicate)	3 ozs. 125 grs. ($18\frac{3}{4}$ teaspoonsful, level)
Sodium bisulfite	$\frac{1}{2}$ oz. (4 teaspoonsful, level)
Cold water to make	32 ozs.

For tray development (13) average time for most rolls at 68°F. is 29 minutes. The recommended developing temperature is 77°F. for 16 minutes. At 85°F. develop 8 minutes, at 90°F. develop $5\frac{1}{4}$ minutes. For tanks develop for 35 minutes at 68°F., at 77°F. 18 minutes, at 85°F. 10 minutes, at 90°F. 8 minutes.

Develop 35 mm. Super XX and other 35 mm. high speed film 20% longer.

After the first roll add 15% to the developing time of each consecutive film. About 6 to 8 film per quart can be developed.

Up to 25 rolls can be developed in a quart with the use of DK20R Replenish at the rate of $1\frac{1}{4}$ oz. for the first 12 rolls then at the rate of $\frac{3}{4}$ oz. for the rest. Do not increase developing time. (8f).

12. Replenisher for use with D23 and D25.

KODAK DK 25—R

Water, about 125°F.	24 ozs.
Elon	145 grs. (3 teaspoonsful, level)
Sodium sulfite	3 ozs. 145 grs. ($18\frac{3}{4}$ teaspoonsful, level)
Kodalk	290 grs. ($4\frac{1}{2}$ teaspoonsful, level)
Cold water to make	32 ozs.

Dissolve chemicals in order given and use as directed with each developer.

13. Orthochromatic film such as Verichrome and Plenichrome can be handled in the red safe-light with flame low, but panchromatic film such as Super Pan Press and Super XX are handled in total darkness. As an exposed film is unwrapped the tail end comes first. It is attached to a short piece of black paper that is loose from the wrapper. Remove the piece of paper and allow the film to roll up separately from the wrapper. The front end is attached with tape which should be removed. Hold the detached roll of film between the thumb and one finger of the right hand. With the left hand fingers grip the end of the film and unroll six to eight inches of it. Submerge the end few inches into the developer and allow it to slowly curl and begin to reroll. Keep the submerged part under the surface of the developer. With the right hand feed the unrolled portion of the film into the developer, and allow it to roll up between the thumb and one finger of the left hand. When the right hand is about an inch from the solution grip the film that is between the thumb and finger of the left hand and unroll another section of the dry film. Repeat this complicated-sounding but easy process until all the film has been fed into the solution. With the fingers of both hands in the solution, keeping the film under, reroll the film into the right hand. Keep rerolling the film from one hand to the other until it is fully developed.

After the knack is acquired it is possible to develop as many as four rolls at the same time. The first roll is fed into the developer and rerolled once, then put it in one corner of the tray. The second roll is treated the same way and put into another corner. After all the rolls have been put into separate corners reroll the first one, and after that the second one. Keep going from one roll to the other until the developing time is up. Then remove the first roll of film and unroll it into the hardener short stop. Rinse the fingers quickly and transfer the second film in like manner. And so on

through the fixer and wash. 35 mm. film can be unrolled right out of the cassette. If the time of development is short only one or two rolls of film should be attempted at one time.

14. Film developer stains are easily removed from the finger with the following formula:

Developer Stain Remover

STOCK SOLUTION A.

Water	32 ozs.
Potassium Permanganate	½ oz. (2½ teaspoonsful)

After washing the hands well in soap and water immerse the fingers in Stock Solution A and rub the stained parts for about a minute. Rinse the hands thoroughly. Then bleach in Stock Solution B.

STOCK SOLUTION B.

Water ...	32 ozs.
Sodium bisulfite	1 oz. (teaspoonsful)

15. Panchromatic and orthochromatic films may be developed by inspection if properly desensitized. Most desensitizers must be used as a separate bath before development but pinskryptol green (made by Ansco, Binghamton, N.Y., U.S.A.) can be added to the film developers in 10 and 11.

Water, warm	1 oz.
Pinskryptol green	1 gr.

Add this solution to one quart of developer. Immerse the film in the developer in total darkness. After four minutes the bromide safe-light may be used but the film should not be removed from the developer and inspected until half the developing time has elapsed. Then it should be held one foot from the safe-light for two seconds. At three feet from the light the film may be inspected as long as ten seconds. Care must be taken that the film is not held above the top of the chimney lest raw light fog it (blacken it). Film should not be kept out of the developer any longer than is absolutely necessary to see what is happening.

16. When developing a film by inspection the image appears to be developed long before it really is. View the image through the back of the film and it will not be so deceptive. When the lightest areas (the shadows) begin to show details of the picture the film is just about ready to be taken out. At first development by inspection is full of uncertainties and it is better to follow directions for time and temperature as you watch what happens.

17. A film-viewing frame aids greatly when developing by inspection. It will minimize danger of fog when using the open chimney safe-lights and make inspection easier by allowing the light to pass through the film and preventing it from shining into the

eyes. In a sufficiently large piece of cardboard, say 10 x 12 inches, cut a hole the shape of the negative and about 20% smaller. A thin sheet of white airmail paper over the hole gives a ground glass effect. Prop this up vertically a foot in front of the safe-light. Hold the film a few inches away from the frame to inspect it.

18. The Acid Short Stop bath arrests the development, and rinses the developer from the film. If acetic acid is not available water helps but does a poor job.

ACID SHORT STOP

Water ...	32 ozs.
Acetic Acid (glacial)	½ oz.

Rinse film for 1 minute before transferring it to the fixing bath.

19. In warm weather hardening the film is important to prevent reticulation. The following formula is used in place of the Acid Short Stop.

Tropical Hardening Bath for use up to 90°F

KODAK SB—4

Water	32 ozs.
Potassium chrome alum	1 oz. (5 teaspoonsful, rounded)
Sodium sulphate	2 ozs. (13 teaspoonsful, level)

Harden the film for 3 minutes. If a tank is used agitate it for a few seconds or streaks may occur. The solution will not keep long after it has been used once and should be discarded after it has lost its purple colour. If sodium sulphate is not available it may be omitted, or ½ oz. glacial acetic acid may be used in its place.

20. It is important that film be properly fixed to insure permanency. Fixing for too short a time, or in old solution will lead to fading of the image in time to come, and may cause stains. The easiest way to dissolve hypo is to put it in a bag and suspend it just inside the top of a graduate or other container. Pour hot water over it, or just suspend it in cold water, which takes longer. The cloth used should be such that it will retain the dirt that is often found in hypo.

21 FILM FIXING SOLUTION

Water	32 ozs.
Hypo crystals	8 ozs. (one cupful)

Plain hypo fixes as well as any other formula but has no hardening action and can be used only for one day. After it has once been used it does not keep. It may be used for negatives or prints but in hot weather it should not be used. Fix film twice as long as it takes to clear.

22 ACID FIXING SOLUTION

Water	32 ozs.
Hypo ...	8 ozs. (1 cupful)
Sodium bisulfite	¾ oz. (6 teaspoonsful, level)

Acid hypo may be used over and over again and keeps well. It is excellent for all around use and has some hardening action. Fix film twice as long as it takes to clear. If water above 80° must be used for washing the Tropical Hardening Bath (19) must be used with it. If it takes more than 5 minutes for the creamy emulsion to clear from the film it should be discarded. See Hypo test 24.

23. **Acid Hardener Fixing Solution**

KODAK F—5

Water	24 ozs.
Hypo	8 ozs. (1 cupful)
Sodium sulfite (dessicated)	½ oz. (3 teaspoonsful, level)
Acetic acid 28%	1½ fl. ozs.
Boric acid crystals	¼ oz. (1½ teaspoonsful, level)
Potassium alum	½ oz. (3¼ teaspoonsful, level)
Cold water to make	32 ozs.

To make 28% acetic acid add 3 parts acetic acid to 8 parts water. Acid hardener fixing bath is one of the finest fixers for hardening film and papers. Fix film twice as long as it takes to clear. Used in connection with the Tropical Hardener it gives film a very tough surface. It keeps well. See hypo test 24. When bubbles begin to remain on the surface it is a sign of exhaustion.

24. A hypo test for testing the condition of the fixing bath is merely a 10% solution of Potassium iodide. With a medicine dropper put one drop into the hypo. If it remains clear the hypo is still good. If the drop gradually or quickly becomes cloudy the bath is exhausted and should be thrown out.

25. Film must be washed thoroughly. Hypo left in it will bleach the image in time. In fast-flowing water that completely changes in 1 minute or less the film requires at least 12 minutes washing. If it takes longer than this for the water to change the time should be lengthened proportionately. Fine grain negatives should be washed at least one hour. When water is scarce film can be washed in a tray, the water being changed at least 12 times at three-minute intervals, and the film being kept in motion as described in 13. Prolonged washing will remove all hypo from the film. The washing test (55) may be used. Temperature does not effect the washing time of film. During washing should the film be touched with hypo contaminated hands, or other film added for washing the washing must begin anew.

26. Before drying film it is good practice to rinse them in a tray of clean water with a few drops of wetting agent in it to prevent water marks. In the absence of proper clips film may be hung to dry on beheaded nails, or old phonograph needles, in a doorway or window. Care should be taken to see that they do not touch anything, or swing together. Should several get stuck together they can

usually be soaked well and carefully pulled apart. Film and negatives should always be handled by the edges to prevent damage.

27. Photographic prints the same size as the negative are made by pressing the paper in contact with the negative and exposing it to light. In place of the regular printing frame a sturdy picture frame with a stiff back may be used though it is not so convenient. Perfect contact is important for wherever the paper does not touch the negative that section will be blurred. The emulsion side (dull) of the negative is placed next to the coated side of the photographic paper. When contact in the frame is sure expose it to some constant light source such as an Aladdin lamp, Petromax, or lantern. Sunlight is unreliable since it varies considerably with the weather. If a lamp is on a lampstand, place it 2 or 3 feet from the door and hold the printing frame next to the door jamb with the negative facing the light. This practice will ensure uniform duplicate exposures. By using an enlarging paper and the orange safe-light (4) exposures can be made by simply lifting the chimney from the lamp and replacing it. When making exposures in his manner all photographic papers should be put away to prevent fogging. See 39 for test strips.

28. Printing boxes can be made for use inside the darkroom. The box should be deep enough so that the light will spread to an even intensity when it strikes the printing frame in the top. If the light is too close the center of the print will be light and the edges darker. An automobile headlight bulb may be used with a storage battery, or a number of 3-volt flashlight bulbs may be arranged in a rectangular square and powered by large dry cells. A switch should be placed on the side of the box so it can be easily used for making exposures.

29. Printing masks can be made by cutting a hole the size and shape of the image in a piece of black paper or red celluloid which should be a little larger than the negative. Strips of thin deep red or black scotch tape may be stuck on the inside of the printing frame glass. A number of readymade cheap masks are on the market.

30. Enlargements are made by projecting the image of the negative through the lens of an enlarger which is really a camera adapted to work backwards, and works in a similar way to the slide projector. In fact some have used their projectors for enlargers, but it is of little use except for 35 mm. film. Since the light is so strong contact printing paper must be used. Shield the projector to prevent stray light from striking the sensitized paper. Unless one is a skilled craftsman it is better to buy an enlarger, for most home-made ones are sources of more trouble than pictures. An enlarger can be rigged up to run from a 6-volt storage battery by using an automobile headlight bulb in a midget flash bulb adapter. The exposures will be longer by several times than when using house current. A 21-

candle power bulb almost equals 32 watts, and will burn for over 15 hours continuously on a normal battery in good condition. The car can be parked outside the darkroom and wires run from it to the enlarger.

31. If no easel is available masks can be made from black paper or deep red Celluloid sheeting. A strip of scotch tape will make a convenient hinge which can be stuck to the baseboard wherever it is needed. For large prints an easel is almost indispensable.

32. The negative is put in the film carrier of the enlarger emulsion (dull) side down, and the paper is placed on the easel with the coated side up.

33. Focusing is done on a sheet of heavy white paper or thin cardboard. Keep the lens wide open. At first focusing will seem awkward, and all sorts of aids are sought. A reading glass is a help. A narrow strip of blackened thin metal one-half the diameter of the diaphragm opening clipped to the lens barrel in such a way that it blocks the passage of light through the center half of the lens will throw a double image if the negative is slightly out of focus. When the lens is adjusted to give a single image the negative is in focus. A strip of black paper attached with scotch tape will serve the same as the metal strip. A fogged piece of film with lines scratched in it with a needle or razor blade can be used for focusing, after which the negative may be replaced. By watching for sharp lines in the negative such as a dress design or trees against a clear sky, or noting when the dark areas are darkest, and the light areas lightest, focusing can be done quickly. If the enlarger light is dim, it is better to use a substitute for the negative.

34. Calibrating your enlarger will make it easier to duplicate a print at a later time, and also aid in focusing. Once you have become accustomed to this system you will wonder how you ever got along without it. There are many kinds of enlargers and this system can be adapted to almost any of them. The projection head usually slides up and down a vertical post, and is counter-balanced by a weight inside the post, or a roller spring. On the tape connecting the counter balance with the enlarger head arm the calibrations are marked with a grease pencil. Proceed as follows:

(1) On a very dark rejected negative or piece of fogged film make two small marks with a razor blade or fine needle exactly one inch apart. On large negatives two or three may be used.

(2) Place this in the film carrier emulsion side down.

(3) With the lens wide open adjust the enlarger until an image of the two marks are the exact size of the marks on the negative.

(4) Just even with the top of the post draw a line straight across the tape. Above this mark the figure 1.

(5) Near the lens, on the rod on which the focusing nob runs up

and down, make another mark at the top of the fixture holding the nob.

(6) Readjust the enlarger until the image is exactly twice the size of the marks on the negative. Make two more marks as explained in points 4 and 5. Mark the figure 2 above the second line on the tape.

The first lines mark the positions at which a projection print the same size as the negative can be made. The second lines indicate the positions where an enlargement twice the dimensions of the negative can be made. Continue readjusting the enlarger and making new marks, each time multiplying the size of the image by 3, 4, 5, etc., until the enlarger head is at the top of the post. Each number indicates where to set the enlarger for that size enlargement. These numbers tell the number of dimensions (usually called diameters) your picture will be enlarged, and not the number of times. To find the number of times multiply the number by itself. A four-diameter enlargement is 16 times the size of the negative. It is also advisable to mark the half diameters such as $1\frac{1}{2}$, $2\frac{1}{2}$, etc., on the tape though it is not quite possible to do it on the rod of the focusing nob.

35. *Using the calibrations.* Almost every negative should enlarge to a standard size print at one of the diameters or $\frac{1}{2}$ diameters marked on the counter balance tape. Suppose a 120 size negative, which is $2\frac{1}{2}$ inches wide, is to be enlarged to 8 by 10 inches. The width of the negative will enlarge to 8 inches at the $3\frac{1}{2}$ diameter mark but the length will enlarge to more than eleven inches. This means that part of the length will have to be left off, and in a great many cases this is desirable. If the full length is required the print will have to be about 7 inches wide. This happens often when group pictures are made and is about the only common exception. If only a part of the negative is useful use a larger diameter. After the print is finished note the diameter it was enlarged on your data sheet (68). With a little practice it becomes almost second nature to look at a negative and decide how many diameters it will take to make an enlargement of a certain size.

36. Photographic Papers

The large variety of photographic papers available for almost any need can be boiled down to 3 main types—chlorides, chlorobromides, and bromides. The chloride is also known as contact paper, the bromide as fast enlarging paper, and the chlorobromide as slow enlarging or fast contact paper. Any of them may be used for either purposes. The bromide papers are usually about 300 times as fast as the chloride and chlorobromide varies greatly between these extremes. All these emulsions are coated on a great variety of plain and fancy surfaces. The dull surfaces give the least detail

and are used when the masses or shapes of a picture are more important than minute detail. The glossy surfaces are used when great detail is important, and for small prints. Between these extremes are many beautiful and pleasing surfaces that are more desirable for enlargements and for colouring. For contact papers use the yellow safe-light, for all others the orange (4).

37. No matter how you try you will never have all perfect negatives. To get over this hurdle manufacturers make all types of emulsions in a number of grades or contrasts. Chlorides come in 5 or 6 contrasts; the bromides, and some of the chlorobromides come in no more than four. A number of professional papers come in only the normal grade also called 2 contrast. This grade is used with negatives of good contrast as described in 9. Flat negatives have too little contrast and sometimes the image is very faint. For these negatives contrasts of number 3, 4, or 5 will usually give acceptable and often very good results. Harsh negatives have too much contrast and are usually extra dark. Contrasts 1 or 0 are used for these.

38. The following experiment should teach more about contrast in one evening than pages of words and picture. Choose what you think is good negative, preferably of a person but avoid a subject in white or very light colours. To examine negatives put a sufficiently large piece of white paper on a table in front of a window or lamp. Hold the negative by the EDGE and look through it toward the white paper which reflects an even soft light. Make the best print you can on number two paper, especially watching for detail in the face and clothes. Then make four more but on contrasts 0, 1, 3, and 4. If you have chosen a good negative the number 2 print will be good. The prints on ‡0, and ‡1 will lack contrast and may appear muddy; those on ‡3, and ‡4 will have too much contrast and lack detail in both the light and dark areas. Using the same negative the exposure time on the higher contrast papers should be increased 20% to 25% for each grade, decreased the same amount for the lower grades of paper. Now take a harsh negative, and then a flat one and make the same series of prints with them. You will notice the difference before the job is finished but go through with it and you will have a very helpful visual aid.

39. Exposure or printing time for contact prints is determined by making a series of test strips. Cut a piece of photographic paper the size of the negative into four strips. Place one strip across the important part of the negative and expose as in making a print. (27). Give it ten seconds exposure and develop for one minute. If it is too light make another test giving twice the exposure time. If the image is very faint or there is none at all give about 4 times the exposure. If it is too dark halve the exposure time, if it is black try 1/5th the time. If it takes longer than ten seconds for normal

exposures, or less than five, the light should be adjusted to a proper strength.

40. Exposure test strips for projection printing can be made completely on one sheet of paper, the size of the print, and developed at the same time. After the negative is focused and the picture properly composed, turn off the light and place the paper in the easel. Then proceed as follows using a timer to count the seconds. The loud ticks of a clock may be counted.

(1) Expose the whole sheet for 5 seconds.

(2) Cover 1/5th of the paper and give the remaining 4/5th an additional 5 seconds.

(3) Cover another 1/5th and give another 10 seconds.

(4) Cover still another 1/5th and give 20 seconds more.

(5) Give the remaining 1/5th 40 seconds more.

(6) Develop the test sheet for 2 minutes.

The total exposure for each strip from lightest to darkest is 5, 10, 20, 40, and 80 seconds. Choose the strip that looks the best and make a test print giving that exposure. Suppose the 20-second exposure was chosen. If it appears too light make another at 30 seconds, or if it is dark try 15 seconds. The in-between exposure sometimes gives the best results. On separate tests it is helpful to jot the exposure time on the back of the paper before developing it. Sometimes fluctuations of the electric current give exposure trouble, though a battery-operated enlarger will not have it if the battery is in good condition.

41. A light meter can be rigged up to show current fluctuations. Fit a small low wattage bulb in the bottom of a box. At the other end cut a small hole and put the light meter over it. If the pointer does not rest at the center of the scale, carefully enlarge the hole until it does. It is important that the meter does not get very warm. The box should be long enough so that the back can have ventilation holes cut into it. By comparing the fluctuations with the exposure dial, and remembering that each stop represents twice as much light as the lower one you can adjust the exposure. When making a number of prints from one negative, adjustments made according to the meter will save much waste and discouragement. After a little practice estimating the adjustments will become easy.

42. For light to appear twice as brilliant to the eye it must actually be ten times stronger. For this reason it is impossible to reliably judge exposures in or out of the darkroom. Rules, charts, or meters are indispensable.

43. Dodging or shading of prints is used to alter tones that are too light or too dark. A surprising number of photographs are improved by merely darkening its edges. To do this use a piece of

stiff white cardboard several inches larger than the print. At the end of the overall exposure, while the enlarger light is still on, completely cover the photographic paper with the cardboard. Hold it several inches above the paper. Then draw the board toward you and return it quickly so that the far edge receives a brief exposure, considerably less than 1 second. The second time draw it at an angle so that the right side has a larger area exposed than the left. The third time draw it so that the left side gets the extra exposure. In quick succession continue these alternate exposures for the proper time which will vary for different prints. Ten seconds is usually a safe starting point. By turns expose each side of the picture. To darken areas within the print, such as one face that prints to light in relation to others, cut a small hole in a cardboard the same shape of the space to be darkened but a little smaller and allow this part of the negative to print through the hole. Hold the board several inches above the paper and keep it moving slightly, just enough so there will be a blending of the image at the edges. For an opposite effect, when one spot prints too dark, a wad of cotton or piece of cardboard the shape of the spot is attached to stiff wire and held above the dark area. Suppose the total exposure is twenty seconds. After five seconds have elapsed hold the dodger over the area that prints too dark for say ten seconds. Then remove it for the last five seconds. This too should be kept slightly in motion to prevent a sharp outline.

44. Flashing is very similar to dodging but is done with the negative out of the negative holder. It may be done under a weak light on a table, or in the enlarger using the smallest stop opening. A flashing test is made by exposing a piece of paper as in dodging the edges of a picture (43), but the flash exposures should be made more quickly. The first edge should be flashed 4 times, the second 8, the third 16, and the fourth 32 times. Develop the test the same time you intend to develop the print, then choose the density you think will give the results you want. When negatives give a blank white sky, flashing will save the picture. When dodging does no good try flashing.

45. The following formula is widely used and can be made flexible enough to meet many situations:

General Purpose Developer

Water (125°F.)	16 ozs.	
Elon (Metol) ...	45 grs.	(1 teaspoonful)
Sodium sulphite (desiccated)	1½ ozs.	(9)
Hydroquinone ...	170 grs.	(3½)
Sodium carbonate (desiccated) ...	2¼ ozs.	(21)
Pottasium bromide	28 grs.	(¼)
Cold water to make	32 ozs.	

For contact prints use one part stock solution and two parts water. Develop 45 seconds to 1 minute. For enlarging papers use

the same dilution and develop for 2 minutes, or for less contrast dilute 1 to 4 and develop 2 to 3 minutes. For greater brilliance shorten the exposures slightly and lengthen the development time; for softer tones lengthen the exposure slightly and shorten development. Do not go to extremes for too long development will cause stain and if it is too short it will develop unevenly and give muddy tones. For film dilute 1 to 5 and develop for about 5 minutes.

46. To immerse the print hold it by one corner with the emulsion up, put the opposite corner into the developer and gently but quickly shove it under the solution. A clock should be used for timing. Keep the print under and gently agitate the solution or rock the tray for 1 minute and 45 seconds. Then lift it out by one corner and let it drain for 15 seconds before putting it in the acid short stop (18), where the paper should lose its slippery feeling quickly. It may then be put into the hypo and the bright lights used to inspect it.

47. Sometimes due to unevenness of the lighting on the subject, the negative gives a print that is lighter on one side or in one spot. When the print is about half developed it may be removed from the developer and a little undiluted stock developer can be rubbed on the light area with the thumb or finger. Be careful not to overdo it. It is better to rub it a little and return it to the developer repeating the procedure if necessary.

48. A 10% solution of bromide, when added to the developer in $\frac{1}{2}$ or 1 ounce quantities, allows longer printing time which gives greater contrast. It has a tendency to spoil crisp blacks and is sometimes used when harsh blacks are not wanted. Out-dated papers may often be reclaimed developing them in a developer charged with extra bromide. Longer exposures are needed when using bromide.

49. A solution of sodium carbonate (2 ozs. in 32 ozs. of water) is a counterpart to the bromide. When richer blacks are wanted a few to 6 ounces will do the trick. It also speeds up the developing time and gives greater contrast. When the developer is nearing exhaustion it will give it a new lease on life.

50. The potassium bromide and sodium carbonate solutions can be used nicely together. The bromide may degrade the blacks and the carbonate fog the whites, but together they do a perfect job.

51. Metol may be used to lessen contrast and hydroquinone to increase it. The powders cannot be added to the developer for they will not dissolve and may cause specks of black on the print. For 16 ozs. of working solution dissolve 30 grains of metol in an ounce of hot water (125°F) and pour it in the developer stirring it gently. When hydroquinone is needed use 90 grain in an ounce of water at 125°F.

52. Prints should be rinsed before transferring them to the hypo. The acid rinse for negatives (18) is also used for prints. Its use doubles the life of the hypo, and prints may be left in it until a number have collected which may be fixed and washed together in batches.

53. Any one of the fixing formulas (21 to 23) for negatives will very effectively fix prints. The Acid Fixing Solution is preferred when toning, reducing, intensifying, or doing any other after work on the print. Except for very small batches it is advisable to use two fixing baths. Fresh hypo will fix the first few prints in three minutes or less, but as more prints are added the strength decreases and the true condition of the hypo is never certain. Fix them in the first bath for 5 minutes, rinse quickly in running water, then put them in the second bath for two minutes. If only one bath is used they should be fixed for 10 to 15 minutes. See hypo Test (24). Prints left in the hypo too long will bleach. Prove it yourself this way. Take a second-rate print and let it hang over the edge of the tray, partly in and partly out of the hypo. Let it stand overnight and in the morning you will have another valuable visual aid.

54. Prints are not easily nor thoroughly washed. Washing will only reduce the amount of hypo to a safe minimum, and no amount of care should be considered too great. Wash them in small batches in plenty of running water. Single weight prints require no less than 1/2 hour, and double weight prints at least 1 hour. Very large prints must be washed for 2 hours. To put them in the water and let them stand will not do the job, they must be frequently agitated. Put all of them in the water face down. After a few minutes they should all be turned face up. If after every few minutes they are "about faced" there will be no doubt about proper agitation. If the batches of prints are large they should be turned constantly. Be careful when turning large prints that the emulsion is not cracked by rough handling. The following system requires less handling of the prints, but much more water. Corks that have been cut in half vertically and bound together with rubber bands make excellent clips that will suspend the prints in deep water. Sometimes rustless clips are needed to weight the bottom edge of the print.

55. This washing test for films and prints may sound like a lot of work but is very easily used once the stock solution is mixed.

Washing Test Solution

KODAK HT—1a

Distilled water	6 ozs.
Potassium permanganate	4 grs. (3 pinches)
Sodium hydroxide (caustic soda)	8 grs. (18 medium size flakes)
Distilled water to make	8 ozs.

Take 8 ozs. of pure water in a plain glass and add $\frac{1}{4}$ dram (8c) of the test solution. Take a roll of film from the wash water and allow water to drip from it for 30 seconds into the glass. Let it stand for 30 seconds. If the colour changes to orange in this time or sooner hypo is present and it must be washed longer. Much hypo will bleach the colour completely. For paper take an 8 x 10 print or its equivalent in smaller sizes and test in the same way.

56. Proper washing assures that prints will not fade in a lifetime under good conditions, but tropical conditions are not very good. Prints can be made really permanent by sepia toning or treating with hypo eliminator. Many hypo eliminators have been devised but only the following one has received the endorsement of reliable authorities.

KODAK HYPO ELIMINATOR HE-1

Water ...	16 ozs.
Hydrogen peroxide (3% solution)	4 ozs.
Ammonia (3% solution)	$3\frac{1}{2}$ ozs.
Water to make	32 ozs.

Wash prints for about 30 minutes at 65 to 70 degrees in running water which flows rapidly enough to replace the water in the vessel completely every five minutes. Then immerse each print about 6 minutes at 68°F in the hypo eliminator solution and finally wash about 10 minutes before drying. At low temperatures increase the washing time. 32 ozs. will treat about twelve 8 x 10 prints or their equivalent. An almost imperceptible yellow tone may be avoided by adding 15 grs. of potassium bromide to each quart of solution. Should a yellow tone appear it can be removed by bathing it in a 1% solution of sodium sulphite for 2 minutes before washing.

57. Drying is easily done on netting or other loose-knitted material stretched over a frame. A good size is 23" x 25" outside measurements using strips of wood $\frac{3}{4}$ inch thick and 2 inches wide. Small blocks about an inch thick at the corners will enable a number of frames to be stacked one above the other and provide good ventilation. Sponge or blot the prints and lay them face down to dry. For occasional work a sheet or a hard-surface towel may be spread over a table and the prints put on it face down. Some prefer to dry large prints on a line suspending them with wooden spring clothes pins.

58. Prints are made glossy by squeegying them on chrome plates, or ferrotype tins (iron japanned sheets). Glossy surfaced papers are made for this purpose since other kinds will not take gloss. They should be fixed in the Acid Hardener Fixing Solution (23). Keep the chrome plates clean by washing them in mild soapy water, and rinsing them in clear water between each batch. Ferrotype tins require a special waxing solution that must be applied after each batch of prints has been dried if sticking is to be avoided. Prints

soaked in one of the commercially prepared glazing solutions for a few minutes have an extremely high gloss. After the tins are cleaned and the prints thoroughly washed, place them face down on the glossy surface of the plate. Cover them with a blotter or thin piece of cloth and blot thoroughly rolling the roller over it. Afterwards remove the blotter and squeegee the prints into perfect contact. Poor contact will leave dull specks or streaks. Set the tins aside to dry. The plates may be leaned against a wall in the sun but the back of the tins should face the sun leaving the prints on the shady side. The chrome plates can be used for forced drying by holding them over glowing coals or a hot lamp. Apply the heat to the dull side of the tins and keep them moving so that all parts of it are brought to an even heat. Prints may be dried in about 10 minutes.

59. Print curl may be greatly minimized by treating them in a solution of water (9 ozs.) and glycerine (1 oz.) for 5 minutes, double weight paper for 10 minutes. It may be used in place of a commercial glazing solution but will not quite equal that gloss. It may be applied to any kind of paper and used with any drying method except forced drying.

60. After all is said and done, and you have exercised more care than you ever dreamed possible, some prints are just too dark or too light. Unless one is extremely light or dark it can be fixed up and it is quite possible that it will be better than the best straight print. Farmer's reducer will fix up the dark ones.

Farmer's Reducer

STOCK SOLUTION A

Water	16 ozs.
Hypo	4 ozs. (½ cupful)

STOCK SOLUTION B

Water	8 ozs.
Potassium ferricyanide ...	2 ozs. (6 teaspoonsful, rounded)
Potassium bromide (may be omitted)	1 oz. (4½ teaspoonsful, level)

For use add 3 ozs. of solution A to 25 ozs. of water, then add 1/8th oz. of solution B (8c). Soak a dry print for at least five minutes in water, then immerse it in the reducer face down and agitate it for 10 seconds by the clock. Do not try to watch the action. Rinse it quickly, then inspect it. This process may be repeated as often as needed but if a print is stubborn another 1/8th oz. of B solution may be added. Proceed carefully for once the light areas, or highlights, are bleached too much there is no remedy. Fix in plain hypo, and no other for 10 minutes, and wash as usual. Many leading photographers give all prints a 10-second dip in Farmer's as a routine matter. It usually adds a little extra sparkle.

61. Local areas may be touched up with Farmer's reducer in the following manner. Place the well-washed print on a smooth, flat surface such as the back of a tray. Sponge off all excess water. Keep a clear glass of water for quick rinsing. Take a piece of cotton and dip it into the solution. Squeeze it almost dry so that none of the reducer will drip from it. Apply it to the area to be reduced with a circular motion. Do not rub hard for only the chemicals do the work. Watch the action closely and just before it is as light as you think it should be rinsed with water. Remember the process can be repeated but if it goes too far nothing will bring back the lost image. After the local area is touched up give it a quick overall dip as outlined above. Fix in plain hypo and wash as usual.

62. Chromium intensifier will fix up the weak prints. The tone may become slightly warm (brownish) but most folk will not notice it, and it may improve the appearance. Some prints will be better if they are purposely printed light with a view to intensification. Pure water should be used for certain chemicals may cause trouble. Distilled, or rain water (6) is always safe.

Chromium Intensifier

STOCK SOLUTION A

Water	16 ozs.
Potassium Bichromate	1 oz. (3¼ teaspoonsful, level)

STOCK SOLUTION B

Water ...	16 ozs.
Hydrochloric acid, concentrated	1¾ ozs.

For use add to 6 ozs. of water, 1 oz. of solution A, and 1 oz. of solution B. Immerse the well-soaked print in the working solution and keep it rocking for at least two minutes, or longer if necessary to bleach the image to a faded brown. For large prints double or triple these amounts. Wash the print well, an hour is not too much, then redevelop in stock solution of the General Purpose Developer (45) for about two minutes. Fixing is not necessary, but a good washing is. If the emulsion feels slippery or soft harden it in Print Hardener (63).

63. Numerous processes that are carried out after the print has been developed and fixed cause the emulsion to soften. Sometimes it may not be noticed until they are put on the glossing tins when they may want to stick. The following hardener is quickly mixed and the washing time is short:

Print Hardener

Water	20 ozs.
Formaldehyde solution	1 oz.

Immerse the print for no longer than 5 minutes and wash for 5 minutes.

64. Sepia toning has always been popular, and what is more it is one of the few processes that make a print absolutely permanent. Drying the print first and soaking it again before bleaching will help prevent uneven results. If the print is not entirely free from hypo it will be reduced.

Sepia Toner

SOLUTION A (BLEACH)

Water	20 ozs.
Potassium ferricyanide	1 oz. (3 teaspoonsful, rounded)
Potassium bromide	1 oz. (4¼ teaspoonsful, level)

Bleach the print in this solution until the deep blacks are barely seen as a faded brown. Rinse well. This solution will keep well in a brown bottle and can be used many times.

SOLUTION B (REDEVELOPER)

Water	5 ozs.
Sodium sulphide (note the "D")	2 ozs. (14 teaspoonsful)

After bleaching and washing use the above redeveloper. Take ½ oz. of solution B to 10 ozs. of water. After immersing the print the image should reappear in a few seconds. The working solution will redevelop many prints but should not be kept for future use.

65. Before bleaching the well-soaked print may be put into solution B (64) for 3 minutes, rinsed and then after bleaching re-developed in the same solution to get darker tones. Prints that have been reduced in Farmer's (60) have a pleasing reddish brown tone. Darker tones may be made by putting a few drops of ammonia in both solutions A and B. A rich tone is obtained by partly bleaching the print in solution A diluted 1 to 4 until the highlights just begin to disappear. Rinse well and redevelop in solution B. Another method is to bleach the print fully, wash well, then allow it to redevelop very slowly in a weak developer. Take 1 part of the General Purpose Developer (45) to 20 parts of water. When it is redeveloped half way or more, wash and finish redevelopment in solution B. All these methods give variations of the sepia tone.

66. In place of solution B (64) the following redeveloper may be used. It is odorless, and will not be dangerous to sensitized materials. It gives still another variation of tone.

Odorless Redeveloper

Thiocarbemide (10% solution)	¼ oz. Use medicine dropper (8c)
Caustic soda (10% solution)	½ oz.
Water to make	8 ozs.

The 10% solutions keep well in brown bottles.

67. Dust is an ever-present menace. In spite of all efforts when the print is done there are often dust spots that show up as white, and other little white spots from various sources. At this stage the only thing to do is to cover them up. Spotting colours are made for this purpose. Water colours can also be used. They are applied with a very fine camel's hair brush (Windsor-Newron's are considered tops). Charge the dampened brush by drawing the tip over the black colour block. If it is too wet the retouched spots will have rings around them. Draw the brush over a blotter until it is just damp enough to leave a smudge and so the bristles hold their point well. Carefully apply it to the white spots. Lighter grays are made by mixing a little white with the black. Sepia prints are retouched with the brown colours. On glossy prints the surface usually repels the retouching. By mixing a few drops of muscilage in a small quantity of water and using this to dissolve the colours there should be no trouble. On rough surface prints the spots may be touched out with Wolff's carbon pencils. HH is the most useful grade, and H and B come next.

68. Negatives are properly kept in separate envelopes. To save envelopes when a number of negatives have been made of one subject they may all be put in the same envelope and interleaved with thin paper. Glassine envelopes are popular and it is supposed that the negative can be seen through it, which is seldom the case. Envelopes of high grade paper are much better for all data about the print can be written on it. It is convenient to have a rubber stamp made as shown. If data on more than one size is to be kept it may be put on a thin piece of paper and put inside the envelope with the negative. Flashing and dodging diagrams can be drawn on the other side of the envelope.

It is good practice to begin numbering the negatives as soon as they are put into envelopes after drying. By jotting the number lightly on the back of each print, just before it is developed, the negative can always be quickly found. 35 mm. negatives keep better and get far less scratches if they are filed in short strips or 4 or 6 negatives each. If they are cut in strips before being rolled up they will remain flat. If they are once rolled up there is no way to keep them from curling. The data sheets can be filed separately if the negatives are numbered.

69. A loose-leaf notebook can be used for the following negative filing index. Since the index is short enough to fit on one page

cross-indexing seemed to be of no value. Each negative is listed under as many classifications as is feasible. Its number follows the title

No.__________ Date__________

Title____________________

Place____________________

Neg.____________________

Paper____________________

Enl. D______ F/______ Size______

Exp.__________ L. S.__________

Dodge, T.______ L______ R______ B______

Flash, T.______ L______ R______ B______

P. D.____________________

Reducer__________ Time__________

Intensifier____________________

Toner__________ Bl______

Remarks____________________

____

____

____

or brief description. The first page carries the full index. On succeeding separate pages the title of each classification or sub-classification is written at the top in the same order as in the index. A person who takes relatively few pictures of plants could put all the sub-titles of Botany on the same page, but would no doubt need

a separate one for each sub-title under "people", and perhaps many for the sub-title "family".

File Index

Category	Sub-titles
ABSTRACTIONS	
AGRICULTURE	
BOTANICAL	Flowers, Fruits, Plants, Trees, Vegetables.
BUILDINGS	Architecture, Churches, Factories, Historicals, Houses, Interiors, Missions, Monuments, Temples, Tombs, Mosques, Schools.
DOCUMENTARY	
DOCUMENTS AND COPIES	
EQUIPMENT	Machinery, Tools, etc.
FOOD AND DRINK	
INDUSTRIALS	
MISSION WORK	
MISCELLANEOUS	
PATTERN DESIGN	
PEOPLE	Activities, begging, comics, crafts, preaching, recreation, sports, work, worship, Aged, Caricature, Children Costumes, Couples. Groups—family, institutions, mixed. Homelife, Individuals, Informals, Studies, Youth.
PLACE	
RELIGION	Idols, Objects of worship Worship aids, etc.
SCENES	Clouds and sky, Desert, Marine, Mountain, Rural, Urban, Snow, Village.
SPECIAL OCCASIONS	Announcements, Birthdays, Funerals, Holidays, Weddings.
STILL LIFE	
STUNTS AND TRICKS	
TRANSPORTATION AND TRAVEL	
ZOOLOGICAL	Animals, Birds, Fish, Insects.

Chapter 37

PRINCIPLES INVOLVED IN THE PRODUCTION OF FILMSTRIPS AND 2×2 SLIDES

J. C. LYALL[1]

HOW are filmstrips made? What material is selected for a definite purpose? What equipment is essential for their production?

These are some of the questions faced by an amateur who is interested in producing his own filmstrips. The writer wishes to make use of the material he utilized in producing a filmstrip on "Hookworm", thereby attempting to demonstrate some of the principles involved in filmstrip production.

In the production of an instructional filmstrip the major steps are:

1. Plan the story and pictures: collect available material and information.
2. Produce photographs, drawings, captions, etc.
3. Prepare the set of "master-prints"
4. Copy the "master-prints" in succession onto 35 mm. film.
5. Print duplicate filmstrips.
6. Write dialogue.
7. Record commentary on disc or tape.

Educators in the field of audio-visual materials recognize that the effectiveness of any visual material is largely determined by the amount of careful planning that has gone into it. This is especially true of filmstrip production because the pictures are in a predetermined order. The sequences in a filmstrip are considerably more complicated than in slide sets and therefore require careful planning.

The following steps in the writer's experience in producing a filmstrip on "Hookworm" may help in other projects. These steps, however, do not serve as a script, but suggest a short and clear synopsis of the content and purpose of the proposed production.

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[1] Mr. Jonathan C. Lyall, M.A., Allahabad, U.P., Director, Audio-Visual Aids Committee of the India Council, Presbyterian (U.S.A.) Mission, has specialized in filmstrip production at Ohio State University.

A. *STATEMENT OF THE PROBLEM:*

To prepare material for a filmstrip (Color), 30 frames, on "Hookworm" to be used in India in connection with Fundamental Education.

B. *IMPORTANCE OF THE PROBLEM:*

1. There exists a wide need for knowledge of simple rules of health in order to check disease and insure the future well-being of the people.

2. "The expectation of life in males in India is only 26.91. Of females it is 26.56."[1]

3. "There is only one doctor for every 8,000 persons in India against one to 750 to 800 of the population in U.S.A."[2]

4. "Ninety per cent of the people live in villages but 90 per cent of the doctors practise in towns."[3]

5. Eighty per cent of the people in urban areas and 95 per cent of the people in rural areas in India are illiterate and it is difficult to send them back to school to learn to read and write. We must find means to communicate ideas to adults without formal schooling. The filmstrip is a medium through which it is possible to impart certain basic facts about health problems.

C. *THE PURPOSE:*

To use this filmstrip in India to show:

(*a*) that a basic requisite for a happy society is a healthy body;

(*b*) that the menace of hookworm can be checked, and people thus become healthier and happier;

(*c*) that a happy family is usually one of that has sound health;

(*d*) that victims of hookworm become physically weak and cannot carry on their daily work successfully;

(*e*) that victims of hookworm are robbed of the very blood they need to build up healthy bodies;

(*f*) that hookworm can be dealt with effectively:

1. if medicine prescribed by a doctor is taken regularly.
2. if a simple latrine is built and used regularly.
3. if shoes are regularly worn by all.

D. *THE PROCEDURE FOR FILMSTRIP PRODUCTION WAS AS FOLLOWS:*

1. The *purpose* and *subject* of the filmstrip was determined as

[1] Hindustan Year Book 1953. Banikam Chatterjee St., Calcutta, p. 86.
[2] Ibid. [3] Ibid, p. 466.

definitely as possible, and was "boiled down" into a single statement, viz: "Hookworm—its menace and eradication."

2. *Attitude and experience level* of the intended audience were taken into account.

3. The *character* of the drawings and the sequence of presentation was planned along these lines:

(*a*) "Well-being" includes being *well* and happy.
(*b*) A family grows as happiness increases.
(*c*) The famil contracts hookworm.
(*d*) The family becomes unhappy and loses interest in its normal daily work.
(*e*) Detection of hookworm is introduced dramatically to the head of the family.
(*f*) Close-ups of the hookworm entering the body are shown.
(*g*) The need to see a doctor is emphasized.
(*h*) The working of the medicine is presented in detail.
(*i*) Preventive measures are introduced:
1. Building of a latrine.
2. Wearing of shoes.
(*j*) Happiness and joy return to the family, and keep them happy and healthy by means of preventive methods mentioned above.

4. All available materials and information were collected, which might be used in the filmstrip, or help in its preparation. This included drawings, scientific information of the size and shape of the hookworm, its point of entry in the body, the route it took, its final destination, its food, its multiplicity, and its destruction, etc.

5. The story was outlined and from this a *rough script* with a parallel drawing list was prepared. It is important that through creative imagination the intellectual content of the theme should be expressed in consecutive illustrations and the ideas not really capable of visual presentation be discarded.

6. A "shooting" script list was prepared by grouping subjects for greater convenience in photographing. This entailed a detailed breakdown of the visual treatment of the production into a numbered list of shots, each conceived in terms of the one preceding and the following. Camera angle, position and nature of shots were also noted.

E. *THE FILMSTRIP PRODUCTION WAS BASED ON THE FOLLOWING PRINCIPLES:*

1. Each picture visualized a single idea or subject as simply as possible: e.g., the first picture in "Hookworm" visualized Suresh and Maya as healthy and happy married couple.

2. Pictures were sequential:
   (*a*) No. 1 picture led to picture No. 2 and so on. Picture No. 1 of the couple led to picture No. 2 with two children born to them.
   (*b*) There was logic in progression—picture No. 2 of the children born to the couple suggested this in "as the years rolled by, they were blessed with two children".

3. Pictures proceeded from general to particular. Picture No. 7 pinned down Suresh and his family as particularly afflicted by hookworm menace.

4. Pictures suggested action and were not static. There was action in each shot, for people were doing something: Suresh taking medicine, wearing shoes or digging a latrine. Each picture contributed to the advancement of the story.

5. There was a change of pace to allow the visual treatment of the picture to flow smoothly and naturally with a logical continuity of images. The element of time and space was a crucial factor in determining whether or not the audience would be stimulated to complete the picture in their own lives, e.g., the time needed to show that regular medicinal treatment, use of a latrine and shoes by Suresh and his family was practical to bring back health and happiness to the family and therefore stimulated the audience to follow their example.

6. Pictures helped shift the angle and point of view to forward an idea. The rigidity of static pictures eats into the very core of instructional aids. They are void of interest and lack action. On the other hand action in the pictures generated interest and helped to forward the idea of dealing with the hookworm menace.

7. Pictures expressed relationship. If sequence and continuity are to be maintained, pictures must be related not only to each other but more so to the theme of the filmstrip. A picture that conclusively contributes to a visual pattern as an implicit and unobtrusive stimulus to logical perception, should be preferred for inclusion to pretty and sophisticated pictures for their own sake.

FILMSTRIP SEQUENCE AND ITS ORGANIZATION

Filmstrips are individual frames but they are all tied up in sequence. A sequence is a group of pictures of the same subject in the same setting. It is a series of related views of a given subject. "In a comparison with writing a 'shot' may be taken as equal to a sentence; a scene, a paragraph: a sequence, a chapter."[1] The following may help to understand its organization:

1. *Establishing Shot* is used to establish the subject and indicates

[1] Raymond Spottiswoode. *Films and its Techniques,* Los Angeles; University of California Press, 1952, p. 462.

(a) location, (b) mood, (c) action. It puts across the most important and direct information; e.g., picture No. 1 Suresh and Maya in front of their village home in a happy mood is an establishing shot. It usually consists of:

1. *Long Shot* (LS) to present the picture in toto, e.g., Suresh and Maya with their home in a village surrounding.
2. *Close-up* (CU) to enforce clarity. It is the culmination of a sequence. Big full-face close-ups are very invaluable. Out of this close-up comes a certain amount of intimacy.
3. *Symbolic Shot* surcharges the overall structure from the symbol used, e.g., the white coat worn by the doctor and the presence of the bottles help to establish the fact that Suresh is in a clinic. Symbols must be clear. The plough is more familiar than a tractor, the bullock cart than the latest car, the drum rather than the saxophone. If the symbol is not clear it may provide humorous release at the wrong place.

2. *Matched Action* is needed to convey the illusion of action in a number of pictures in the sequence. The illusion of action should match the series of pictures in the sequence, e.g., in Suresh's getting down from the tree, going to the clinic, taking the medicine, the reaction of the medicine on the hookworm in the intestines all show a matched action in the filmstrip. Alternate angle shots help to achieve this end.

3. *Cut-away* is very helpful when the action does not match in the series of pictures. You can cut-away from the action and the audience will still go with you. Cut-away is a kind of bandage which covers the wound, e.g., there seems to be no matched action between the wearing of shoes by Suresh and his family and the action of making a latrine. In order to keep up the continuity in the two sequences a picture of one foot was used to carry the audience along with Suresh to see what further action he was going to take to stop further hookworm contamination. Cut-aways release rigidity of sequence and allow the introduction of relevant material without loss of interest.

4. *Transition Shot* helps to bridge sequences. Sequences are very closely knit together. There are several types of sequence transitions:

(*a*) *Visual transition* gives visual satisfaction.

(*b*) *Narrative transition* fixes attention on each scene or picture and propels it forward to the next, thus bridging that moment of transition between the pictures.

(*c*) *Music transition* creates an atmosphere to bridge the sequence in a dramatic manner.

FILMSTRIP SCRIPT WRITING

How do I begin? This question is invariably faced by every person who is anxious to write a story or a script for a production. Story-telling quality in a script is essential, because each picture must move the story along in relation to the picture preceding or following. The closer it comes to telling a story which reaches into the life of the audience the better.

In order to write a script we must have an objective. We assume that we have something to say. Generally, there are three stages that may help to say what we want to say:

1. *Beginning*—it signifies a given situation, usually a familiar one. It is usually a medium or long shot establishing the location, and introducing the characters and starting the picture on its way. For our audiences this must contain a large element of the familiar. We begin with the known and proceed to the unknown, e.g., introduction of Suresh and Maya in their village home in picture No. 1 brings to the village audience familiar characters.

2. *The Middle*—it is that dramatic moment when the familiar is upset. It may be the moment of decision when one must decide which of the two ways to follow. It is charged with emotion and that emotion must be transferred through picture and word. In "Hookworm" it is when Suresh is asked to get down from a tree and go to see a doctor. Will Suresh go to a doctor to get rid of the hookworm or will he just let himself and his family be destroyed by this enemy.

3. *The End*—it suggests a new situation, and the remainder of the pictures bring readjustment and should suggest the next step or stir people to action. The most effective pictures should be reserved for the end of the story. There must be mounting interest, wholesome emotional response leading to action. The end, however, must not suggest that this is the end of the matter, but that it is only beginning and the rest is up to those who see it. It might well become the dramatic moment for the audience after which they will have to complete the picture in their own lives; e.g., the regular clinical treatment of hookworm, wearing shoes and using a latrine. Thus, the filmstrip does have closure—but remains open. We end with a semi-colon, not a period.

SYNOPSIS

Every good script has a synopsis. It may include one paragraph for the beginning, the middle and the end. It should be clear, concise and simple. It should be rewritten until it says exactly what one wishes to say.

SHOOTING SCRIPT

It is very essential that a detailed breakdown of the visual treatment of the production into numbered list of shots be prepared. This will constantly be referred to as a guide while shooting the pictures for the filmstrip. It should have:

(*a*) complete directions to camera man for each shot;

(*b*) the number of persons and objects (props and the like) to be included in the picture;

(*c*) general background to be included in the picture;

(*d*) suggestions for composition of shots, e.g., close-ups, long shots, etc.;

(*e*) suggestions for alternate shots in case a particular shot cannot be had.

PRODUCING PHOTOGRAPHS, DRAWINGS, CAPTIONS, ETC. FOR FILMSTRIP PRODUCTION

1. *Photographs:*

Since a standard-size master print is an intermediate stage in filmstrip production, any size camera can be used for taking the original picture. A standard photoelectric meter and a portable tripod are useful. If interior shots are to be taken, it will be necessary to have photoflood or synchronized photoflash equipment. Any black-and-white or color film of fine grain will do a satisfactory job. The pictures should be taken according to the "shooting script", and an original or copy negative must be available for each frame of the filmstrip except where the material is already available in the correct size. Each picture should be so composed that the whole picture area is filled with the subject matter relevant to the idea you want to transmit. A good picture will show no more than is needed to convey the idea. In order to have satisfactory reproduction, negatives should be *correctly* exposed, developed and of normal contrast. Camera angles, location, background as well as lighting problems should be considered carefully before shooting the pictures.

2. *Drawings, Diagrams, Captions, Etc:*

These should be made as simple and as legible as possible. Lines and lettering should be heavy enough to photograph clearly, and be clearly legible when viewed at a distance of 6 times the longer picture dimension. If possible the height of any lettering should be at least 1/20th the narrow picture dimension.

The pictures in a filmstrip often need supplementary information to help them tell their story. This can be presented by means of captions in the filmstrip itself. Short captions and explanatory information can be lettered on the pictures themselves, while occasionally

a caption or study frame can be used to emphasize important points. It should be remembered that:

(*a*) in order to tell the story clearly captions and titles should be tied up with the original purpose of the filmstrip;

(*b*) words and sub-titles are extremely helpful to convey the full import of the filmstrip when pictures fail to do so;

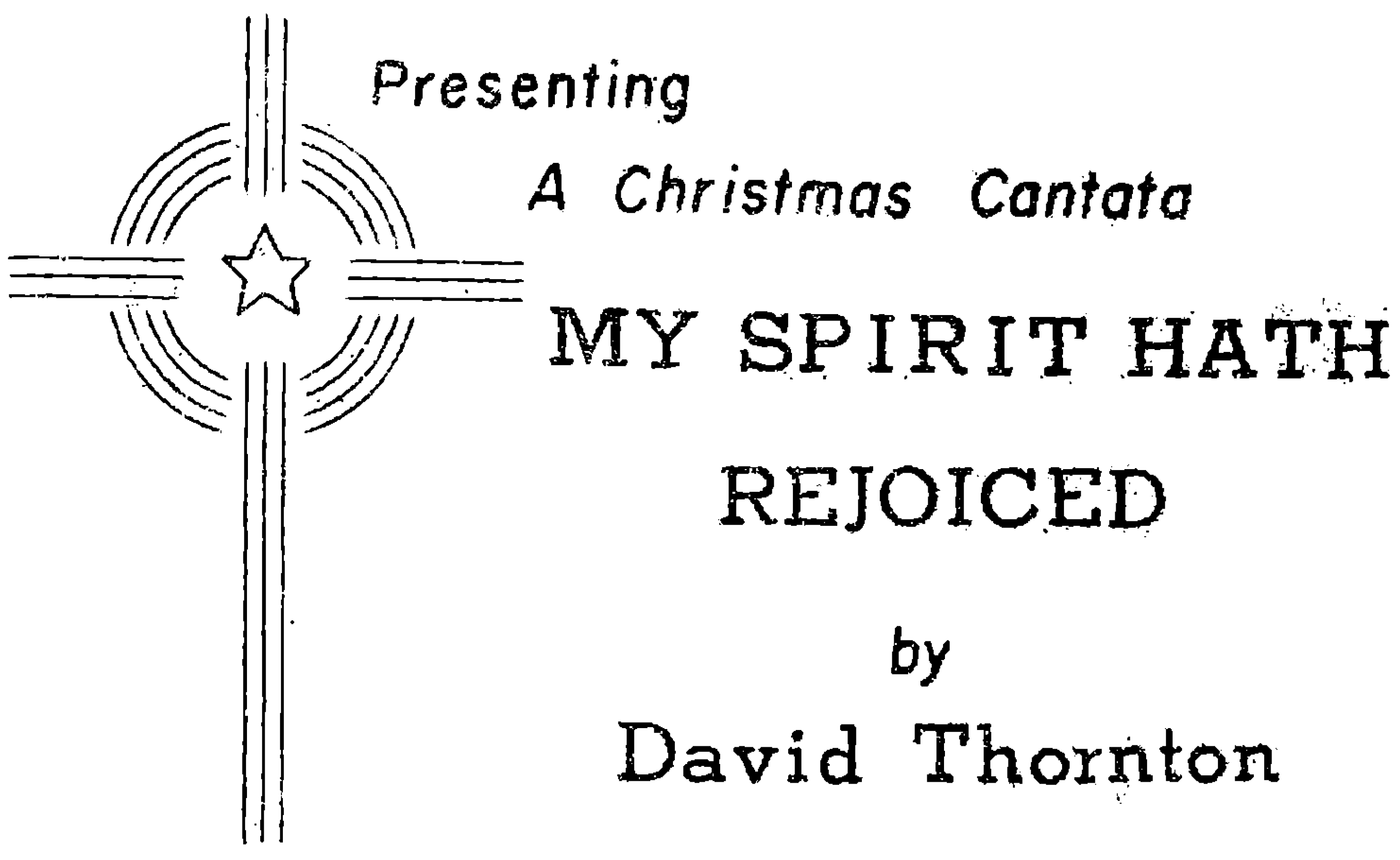
(*c*) captions and titles should be interesting and perhaps have a catchy use of words. They should have 'punch'.

The final form of these should be considered at stage three in planning, since they greatly influence the nature of the filmstrip, its production, and its use.

For lettering photographs and drawings the writer has found the following very practical:

1. *Gummed paper letters:*[1] These letters come in very small sizes, 1/8 inch to 4 inches and cost from 50 cents to $2.00 per 100 letters. They are relatively clean letters but demand care in gluing. They are good for short captions or titles and can be obtained in various colors, etc.

2. *Artype letters:*[2] These are very good to use directly on photo-



graphs. They come in sizes $\frac{1}{8}$ inch to $1\frac{1}{2}$ inch high and cost 75 cent a sheet. A sheet is 10″ × 14″ in size. These letters are excellent for

[1] Tablet and Ticket Co., 1021 West Adams Street, Chicago 7, Illinois.
Artype Incorporated, 549 W. Randolph St., Chicago 6, Illinois.

simple labelling and short title work, but because of cost are not practical for quantity work.

3. *Leroy:*[1] Leroy lettering is "controlled" lettering. A rigid scriber holds the pen in exact alignment and insures accurate reproduction. A person can letter 60 to 80 words an hour.

4. *Rubber stamp letters:* These can be obtained in many styles and sizes. If care is exercised in preparing rubber letters the results achieved are excellent.

5. *Plaster letters:*[2] These can be photographed against plain or pictorial backgrounds to produce a wide variety of effects.

PREPARING "MASTER" PRINTS FOR FILMSTRIP

The pictures within a filmstrip are all horizontal in format, although all can be vertical if desired. However, it is not desirable to include both in the same filmstrip. This calls for all material photographs, drawings, illustrations, etc., as far as possible to be in exactly the same size. This (standard-size) will make the shooting of the material for the actual filmstrip an easier process. This standard-size could be along the lines of 8 x 10, 9 x 12, or 11 x 14 inches.

For good filmstrip quality all master prints of continuous-tone subjects must be of correct photographic quality, with equal density in the significant highlight areas.

A glossy-surfaced paper, such as Kodabromide F. should be used for the master prints, and should be processed according to the manufacturer's recommendations by standard darkroom methods. Prints should be ferrotyped (glossy) unless artwork is to be done on them, in which case they are left unferrotyped—semi-matte.

RETOUCHING AND ARTWORK

Any desired artwork, retouching, or lettering should be done on the master prints. Water colors, air-brush, lettering guides, and other standard techniques can be used for this purpose.

MAKING A NEGATIVE FILMSTRIP FROM MASTER PRINTS

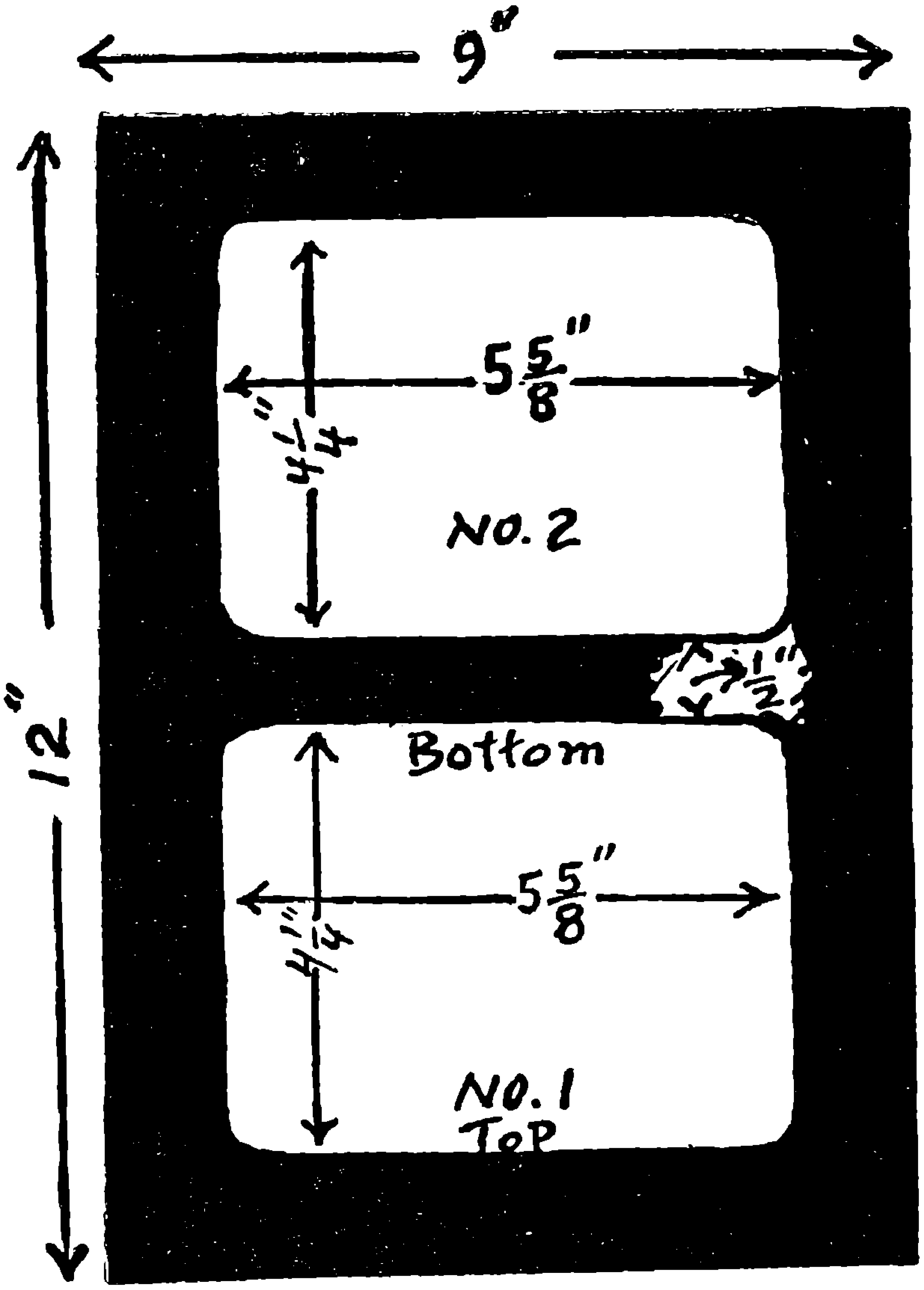
The process involves simply photographing or copying the master prints onto 35 mm. film. There are several ways of copying the master prints. Accurate camera alignment and focussing, as well as registration of the prints, is essential. While it is possible to use a standard 35 mm. miniature camera for this purpose, it is much more satisfactory to use a camera with ground-glass focussing or accurate copying attachment. To support the camera in copying position, a good enlarger stand, or a home-made stand can be used.

[1] Keuffel and Esser Co., New York, N.Y.
[2] Mittens Display Letters, Redlands, California.

One of the most satisfactory methods of copying is to use the Kodak 35 mm. Film Adapter A, with a film-pack camera of the Recomar type.

The method of making the filmstrip by the writer consisted in using a modified 35 Kodachrome adapter with a Recomar type camera (6.5 x 9 cm.). This back can also be used with a 9 x 12 cm. camera or a Kodak Precision enlarger. The modifications of the Kodachrome adapter are these:

1. The film aperture of the double frame adapter is reduced from 24 x 36 mm. to 24 x 18 mm. or single frame size by fastening two plastic opaques in the film aperture.



TWIN-FRAME COPIER MASK

2. In the advance mechanism of the adapter an additional stopping pin is placed 180 degrees opposite the original stopping pin on the same gear. This makes possible a film advance of a single frame instead of a double frame.

3. A mask of thin metal, cut to single frame size, is slipped over the ground glass and held in the correct place by the original double frame mask.

The operation of the adapter is now done in exactly the same way as that of the original double frame, i.e., focussing on the ground glass and then sliding the carriage over to make the picture.

Another way, one which allows the use of any standard 35 mm. camera without alteration of any kind, involves the use of "twin-frame copier mask" Simply two pictures are copied at once so that their images fill the double frame opening, and the pictures themselves are masked to the proper proportions with a black mask or template (see the figure for correct proportions). The resulting master negative and the positive printed from it frame correctly—on any standard filmstrip projector.

The master prints are copied two at a time with a 35 mm. camera. The two pictures to be copied are placed under the "twin-frame copier mask" with the picture No. 1 of the filmstrip at the bottom opening of the mask. The picture No. 2 of the pair is placed at the top opening of the mask. This will result in the correct position of the images on the film. The other pictures are copied in the proper sequence.

In making the individual master print, the desired subject matter is enlarged to fill an area $4\frac{1}{4} \times 5\frac{1}{4}$ inches, and an extra $\frac{1}{4}$ inch is allowed on each side. The "twin-frame copier mask" is needed to compose these prints and is also used when copying them. It is made from thin hard card or sheet metal, and finished in matte black. The openings should be cut with rounded corners, if possible, since this gives a neater appearance to the finished filmstrip. The prints can be mounted in pairs on 9×12 inch cards using the template, although this is not necessary.

The camera is aligned by placing a small piece of ground glass, $1\frac{3}{8}$ inches wide and two inches long, over the film aperture, with the back of the camera opened. The "twin-mask copier" is arranged so that the images of the mask openings are square with the film aperture and fill the aperture area completely. When the camera is tightened to the copying stand, the alignment will remain correct through repeated usage.

LIGHTING AND EXPOSURE

Illumination for copying is furnished by two R-2 Reflector flood No. 2 flood lamps. They should be located in standard positions on opposite sides of the copying surface, converging at an angle of approximately 45° to the lens axis. Illumination on the copy should be even and no reflections from the print surface should be visible at the lens position.

FILMS, PROCESSING AND PRINTING

When only a few prints of a filmstrip are required, they can be made by copying the master prints in succession onto *Kodak Direct Positive Panchromatic Film* 35 mm. This film should be processed according to instructions, by means of the chemicals contained in the *Direct Positive Film Developing Outfit.* For this work, a Kodak Day-load Tank is recommended.

35 MM. PRINTER

If a larger number of copies is required, the master prints should be copied onto *Kodak Panchromatic X Film* 35 mm. From this negative the required number of duplicates are printed on *Kodak Fine-Grain Positive Safety Film* 35 mm. by means of a long home-made printing box, or a 35 mm. printer. In this process the emulsion sides of negatives and positive film face each other. Fine-Grain Positive Film is not commonly stocked by Kodak dealers, but can be obtained on special order through the local dealers.

DIALOGUE OR COMMENTARY FOR FILMSTRIPS

As pointed out earlier in the chapter a picture should present a single idea. Cluttering up many ideas in a single picture tends to produce confusion in the minds of the village audience. There is no impetus to motivate them to action and the purpose of the picture is defeated.

The writer's experience with the Indian village audience has been that very few pictures, if any at all, can on their own merit convey successfully a message. The very nature of a picture being "static" calls for some sort of "audio" to give it an illusion of movement. No matter how technically sound and esthetically perfect a picture may be, the fact remains that it is only a "still" dumb visual representation of human experience that needs articulation to make it meaningful to the audience. Without a proper interpretation a picture to a village audience is just like an unintelligible mass of visual representations floating about on the screen without accomplishing the desired purpose.

In order to make the picture meaningful, it is very important to prepare a simple but well-planned narrative or commentary. This commentary should be related to the pictures, and include points that definitely concern the content of the filmstrip. It would not attempt to describe what is already evident in the pictures, for example, instead of describing, "Now, the doctor is giving some medicine to Suresh" the commentary should reinforce and underline the medical treatment by saying, "Suresh, take this medicine regularly. It is good for you but bad for the hookworm."

The commentary should suggest a "guided interaction between the teacher, the pupil and the material of instruction."[1] To do this it should first secure the attention of the audience. This can usually be done by introducing something which is closer to the experience level of the audience as is done when Suresh and Maya are introduced in a familiar setting and their beaming health and happy facial expressions immediately catch the imagination of the audience. Secondly, it should help the audience to understand the message clearly. Use of simple language (normally, not exceeding 25 words for a single picture) is very desirable. For example, in these words, "But while the children are still small, a dark cloud shadows their happiness for they became victims of hookworm," the audience is initiated to the grim and painful reality of hookworm menace that marred the health and happiness of Suresh's family.

Thirdly, it should create a situation where the message either will be accepted or rejected by the audience. The regular medical treatment taken by Suresh and his family underlines the situation in these words, "When you take this medicine, the hookworms lose hold on your intestines and are killed. They can, therefore, no longer rob you of your blood." And finally, the audience should be stirred to positive action through the example of Suresh and family when Suresh is told, "From now on, do not forget to wear your shoes always, and be sure that you use the latrine regularly."

RECORDING OF COMMENTARY

The commentary to go with the filmstrip is started with a rough outline and picture list to form a tentative script. This is refined by repeatedly "talking" the pictures as they are projected. A tape recorder is particularly useful for this purpose. The dialogue can be recorded on a wire, tape or disc recorder for future presentation. The recording is made by reading the script, and adding picture-change signal, as well as background music, where desired. Picture changes can be indicated by a musical note, or by a pause in the dialogue and a swell in volume of the musical accompaniment. Voice quality and delivery should be appropriate to the subject matter, while the dialogue should be readily intelligible in the finished recording.

MAKING SLIDES

The 2″ x 2″ slide is in common use in Church and school. Fortunately the making of 2″ x 2″ slides is quite simple due to improvements in photographic film and cameras. Any standard 35 mm. type of camera can be used. If interior pictures are to be made a flash attachment should be part of the original camera purchase.

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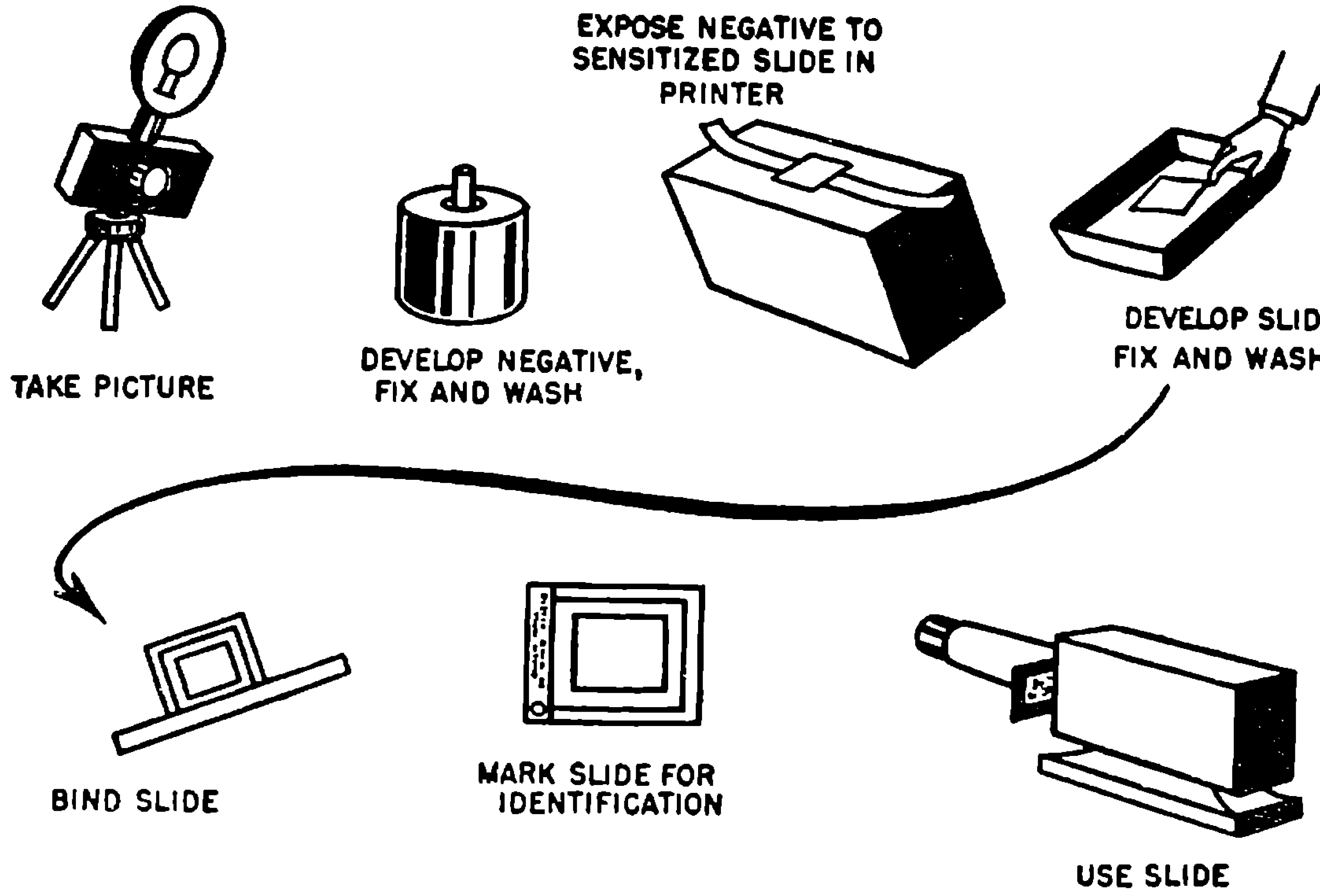
[1] M. S. Knowles, *Informal Adult Education,* New York, Association Press, 1951, p. 31.

In black and white photography the finished slides may be made in two different ways. First, the negative can be made on a regular negative film, then copied in a printer onto small 2 x 2 slide plates and covered with cover glass, or the negative can be printed onto a



STEPS IN MAKING A PHOTOGRAPHIC SLIDE

projection positive film and art and mounted between two slide cover plates. In making color slides it is best for the manufacture of the film to develop the color film and return in pasteboard slide-mounts. The pastor or teacher can then select the slides to be used in a permanent collection and remount in glass to protect them against scratches and damages.

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Tablet and Ticket Co., 1021 West Adam's Street, Chicago 7, Illinois.

Chapter 38

EQUIPMENT RECOMMENDATIONS

RANO K. MUKERJEE[1]

INTRODUCTION

IT is not the purpose of the writer of this chapter to state that a particular machine is the best to buy. It would be like saying which is the best make of automobile to buy. No one would try to answer this question for anyone but himself. However, there are certain specifications to look for in choosing, say, a projector, such as: amount of light thrown on the screen; amount of heat on the film; the steadiness and sturdiness of the machine; etc. There are other points also to be kept in mind when buying a projector, such as, the ease with which slides or filmstrips can be changed.

We need to remember that just as the car that one chooses is not as important as what he will do with it, so the choice of a projector or any other equipment is not as important as a knowledge of what one will do with it. Any of the standard makes will give good service. A little investigation and some judgement will be sufficient safeguards.

Further, the purchase of equipment should never dictate the programme. On the other hand, the programme should demonstrate the need of the equipment.

A great deal of discussion has gone on concerning which is the most effective tool, a still picture or a motion picture, a silent motion picture or a sound motion picture, a single picture or a series of pictures. To settle this question one needs but ask another. Which is better, a five-ton or a half-ton truck? The answer is obvious. It depends on the hauling job you have at hand.

The writer wishes to make it clear to the reader, that, while he will be reviewing several various makes, models and types of equipment and accessories, there are still large number of other excellent makes and types of equipment, which, because of shortage of space and more precisely, on account of its non-availability in the local market, will not be included. The fact that they are not mentioned

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in this chapter, should not suggest to the reader that they are unworthy of his attention.

STILL PROJECTORS

1. The "Aldis Universal" Projector:

The "Aldis" filmstrip and slide projector is strong, light, scientifically accurate and simple to operate. It produces a brilliant screen image and an even illumination over the whole screen surface. The lamp supplied with this projector is a standard pre-focussed lamp of 250 watts, and may be obtained for use on any of the usual voltages. An ample length of 3-core cable is supplied and by attaching an appropriate plug, and then inserting the latter into any convenient power-point, the projector is made ready for instant use. Tilt adjustment is provided for by the three-point base. The two front feet are independently adjustable and the rear foot is surfaced with a non-skid material. An unusual feature is the screw insert for a camera tripod beneath the base.

The "Aldis" lens supplied is standard and has an "F" value of 3.5 and a focal length of 4 inches, but 2″ and 6″ lenses are also available for special purposes—the 4″ lens may be used to provide a picture ranging in width from 2 feet to more than 12 feet at a distance of from 6 to 35 feet. Focussing is achieved by turning the lens in a screw-like manner within the lens mount (this is the simple meaning of the description, "Helical focussing mount").

Both the slide-carrier and the film carrier are complete units and are easily interchanged by sliding them on or off the two chrome-surfaced runners attached to the rotatable picture-head, the lens mount (also held by the runners), being removed first and then simply pushed back onto the runners after the required carrier is placed into position. The carrier and lens mount are quickly and firmly held in place by tightening the locking screws. Unlike most projectors, the "Aldis" film-carrier has no sprocket-wheel to control the movement of the film. Instead, two chrome-clipped spools are provided and the film is attached to and may be wound up upon either, thus allowing the screened pictures to be viewed and re-viewed at will without delay. Either spool may be turned by means of the knurled knob to which it is attached. A removable mark-plate is provided and both single and double-frame filmstrips may be used. The rotatable picture-head may be smoothly turned throughout 360 degrees, a slight "click" being felt, (rather than heard), when the head is positioned in either horizontal or vertical plane.

An important feature of the "Aldis" is the provision made for projecting from micro-slides. The Micro Attachment is a complete unit, and is fitted with an "Aldis" 1.4″ lens and a supplementary stage.

The total weight of the projector is 7¾ lbs. It is supplied complete with accessories, and with either of two different types of carrying cases.

2. The "Viewlex" Model: V-22CL:

This combination slide and stripfilm projector is designed for extreme simplicity of operation combined with maximum efficiency. Finger-tip control, instantaneous framing and clear, needle-sharp focussing all combine to make "Viewlex" a top choice for slide and filmstrip projection before sizeable audiences. The quiet and powerful motor-fan gives utmost protection and safeguards the life of valuable films and slides. This model carries a 300 watt lamp and a 5″ Luxtar F/3.5 coated color corrected lens. Supplementary 7″, 9″ and 11″ lenses are also available. Two switches are provided. The lamp switch is inoperative unless the motor fan cooling system is operating. This arrangement permits extra-rapid cooling of the lamp and greatly lengthens lamp life. The filmstrip attachment accommodates single and double frame, vertical and horizontal pictures. Condensing lenses and heat filters are easily removed for cleaning without use of tools. Each condensing lens and filter holder is marked, identifying the type of lens and its proper position. Thus, in short, this projector is a sturdy piece of equipment and with reasonable care it can give a long trouble-free service.

3. The S.V.E. Model: AAA:

This particular projector has a very practical use in a country like India. It is specially equipped with a battery adapter cord, a 5″ lens, automatic rewind device, semi-automatic slide changer and attachments for showing both single or double-frame filmstrips. The cost is reasonable and within the budget of a church or institution. The projection lamp should be ordered with regard to the voltage available. If it is necessary to adapt the projector from use on 220 volts mains to a 6 volts battery, all that is needed is to change the projection lamp (a 220 volts lamp to a 6 volts lamp). It is recommended that the following projection lamps should be stocked:

(*a*) 230 volts (AC or DC) the most convenient in India.

(*b*) 120 volts (AC or DC) the cheapest to use.

(*c*) 6 volts (DC) for battery for non-electrified areas.

Extra 3″ and 7″ lenses may be purchased with advantage in making the projector more adaptable in its use.

4. S.V.E. "Schoolmaster":

If you require real versatility without paying a premium to get it, this smart, all-new projector is unmistakably, the answer to your needs. The "Schoolmaster's" compact size (8 5/8″ high, 5 1/8″ wide,

$11\frac{3}{4}''$ long), makes it ideal for use with small groups. But its incredible brilliance means it is ready and able to fulfill large audience projection requirements. One piece aluminium casting assures sturdy, rugged performance and light weight, so that a child can carry the 7 pound "Schoolmaster" from room to room. It switches from filmstrips to slides in 7 seconds! Once the slide changer has been fitted into the machine, it need never be removed. The projector is designed to accommodate, as an accessory either the S.V.E. Horizontal Transverse Carrier, the Semi-Automatic or the Airequipt Fully Automatic Slide Changer. It is a completely self-contained projector—no parts to remove or attach. Although it is an integral unit, the entire optical system can be removed from the projector for the purpose of cleaning or lamp replacement. It has a single slot film channel and helical focussing. An automatic warning "click" indicates film ending. It has a powerful blower system, thereby achieving maximum coolness and film protection. However, its use is limited to a mains supply of 110-115 volts AC.

5. "Golde" Slide-Strip Projector Model: "Filmatic":

This is a combined 2" by 2" slides, single and double-frame filmstrips projector, having a 200 watts lamp and is blower cooled. It has a 5" coated projection lens and is available for operation on 220 volts AC in India.

6. S.V.E. International Projector:

This works on kerosene and takes both single and double-frame filmstrips and 2" by 2" slides. It is equipped with a "slipin" filmstrip carrier with rotating head, locking in vertical and horizontal positions. The glass aperture plates release with film movement. The picture changing mechanism is provided with automatic stops which centre the picture as the strip is advanced. A mask is provided for single-frame strips. The filmstrip carrier can be delivered with an automatic rewind take-up, if so desired. A carrier for 2" by 2" slides can be inserted in the apparatus.

The optical system is mounted on a cylinder which is fixed on the kerosene lamp by means of screws. A door in the cylinder makes the interior of the lamp accessible. A carrying case with handle and a partition to accommodate spare mantles can be supplied.

The light source is a Coleman lantern Model No. 237 (Empire) with special SVE mantles No. 199 which can be operated with kerosene or petrol. Its nominal horizontal luminous intensity is 500 candles, and running time per fill is 10 to 12 hours. A $2\frac{3}{4}''$ metal reflector is provided. The Condensor lens is bi-convex, with 2" diameter. In view of the fixed position of the SVE mantle in the Coleman lamp, no special centring system is provided for. However, provisions are

made to centre the projector aperture horizontally and vertically over the picture. The projector has no tilting device. Cooling is achieved by the air convention method, i.e., by means of a system of air holes. On the whole this is a sturdy and dependable projector and worthy of an investment.

7. The "Keroscope" Projector:

This also is a kerosene projector and is adaptable for use with a 6 or 12 volt car battery. This projector is usable for 24 by 36 mm. and 18 by 24 mm. filmstrips, and for 2″ by 2″ slides and also for microscopic specimens. The projector is designed for use in both tropical and arctic conditions. The rotating head, in which a slide-carrier is inserted, is exchangeable for a sprocketless filmstrip carrier with special film gate (patent) instantly detachable so that preloaded gates can be introduced during projection, and exchangeable for micro-slide holders. The guide rods of the optical system can be retracted into the main body of the instrument when not in use. The kerosene lamp or the electric attachment, both of which can also be used for general lighting purposes, is inserted into the projector by the door of the projector. A carrying case is supplied only on request. The nominal horizontal luminous intensity of the lamp, when operated on kerosene, is 300 candles.

An electric attachment with long holder type Standard Miniature B.C. accompanies each projector, both for 6 volt car head-lamp or a 12 volt car head-lamp. For operating 12 volt lamp off electricity mains (AC only) different types of transformers, according to the voltage of the mains, can be supplied upon request. The Condenser consists of twin lens system, the latter being optically ground and polished. The centring system consists of a screw at the bottom of the front panel. The kerosene lamp can be adjusted horizontally by rotating it. The tilting device consists of adjustable rear legs. The projector incorporates air convection cooling and is also fitted with a heat filter.

8. Other Miscellaneous Still-picture Projectors:

A. Opaque Projectors: These are of special use in schools and colleges and can also be effectively used in Sunday Schools. The best known make is the Charles Beseler Epidiascope, Model OA2. This takes in material upto the size of 6¼″ by 6¼″ It can also be turned into a 3¼″ by 3¼″ or 3¼″ by 4″ or 2″ by 2″ slides and 35 mm. filmstrip projector. The projector is supplied complete with one 18″ focus lens for opaque projection, a 9″ lens for cinema slides projection, a 500 watt projection lamp, double slide-carrier and is blower cooled. It is obtainable in India from Electronics Ltd., New Delhi, for direct operation from 220 volt mains AC. Adapters for showing 2″ by 2″

slides and 35 mm. filmstrips are available for this model, complete with a slide-carrier and a 5" focus lens.

B. The Projectograph: This self-contained slide projector shows 2" by 2" colored or black and white slides on a built-in Polacoat screen of about 88 square inches.

The Pic disk which holds 14 slides, automatically moves at intervals, changing the slides and thus repeating the sequence. The projector is ideal for displaying slides in hospital waiting halls, institutions and even in a church entrance advertizing the month's important events.

The Projectograph operates on 110 volts AC, and therefore requires a step-down transformer for the 220 volts AC mains.

Electronics Ltd., New Delhi, are agents in India for this piece of equipment. Model 1650 Deluxe is recommended.

MOVIE PROJECTORS

A. Silent:

Among the popular silent projectors available in India, the Pathe Webo "Pax" 16 mm., has the following specifications:

It is blower cooled and contains a 750 watt projection lamp, a 3" (70 mm.) F.1.9 coated lens, with 1,600 ft. reel capacity. The projector has 12 big teeth sprockets to ensure long life to films. The single-teeth sprockets enable screening of sound films also. It has a built-in elevating device and has a silent/sound speed switch provided. The projector requires 110 volts AC or DC. and is priced at Rs. 1,300 by Electronics Ltd., New Delhi.

B. Sound:

1. The Victor 60-4 "New Light-Weight" 16 mm. Sound Projector:

This moderately priced sound projector incorporates a 750 watt projection lamp, but can accommodate a 1,000 watt lamp. It has a 2", F: 1.6 coated lens, a 4 watt out-put amplifier, a microphone/phone input, a 9" top-mounted speaker (J4B) and a 50 ft. cord with a 1,600 ft. take-up reel. It operates on 100-125 volts AC/DC.

2. The Victor 60-10 "Escort" Sound Projector:

This has a 750 watt projection lamp, but can accommodate a 1,000 watt lamp. It also has a 2", F: 1.6 coated lens, a 10 watt output amplifier, a high-gain microphone/phone input, a 12" speaker (J3A) in a separate case, 75 ft. cord and a 1,600 ft. take-up reel. The Projector operates on 100-125 volts AC 50-60 cycles.

3. Revere, Model: SP—16, 16 mm. Sound Projector:

This projector is fitted with a 750 watt projection lamp, a 2", F: 1.6 coated lens, 1,600 ft. reel capacity with extension arms,

a 5 watt AC/DC amplifier, a microphone/phono connection and comes complete with speaker, carrying case and cord. The projector operates on 110 volts AC/DC.

4. The DeVry "Bantam" 16 mm. Sound Projector:

This is a 220 volts AC/DC projector, thus requiring no converter, transformer or resistance, like other makes. The single case including amplifier, speaker and other accessories, weighs only 28 lbs. It has a 750-watt, 220-volt projection lamp and is air-cooled. It comes with a 2", F: 1.6 coated lens, a 220-volt AC/DC motor. The film reel capacity is 2,000 ft., although the projector is supplied with one 400 ft. take-up reel. It has a built-in 5-watt amplifier and a 6" speaker with frequency range upto 7,000 cycles.

5. Keystone's "Belmont", K.161 Sound Projector:

This is, perhaps, the only complete 16 mm. sound projector with:

(*a*) A built-in splicer for on-the-spot splicing and editing. The splicer slides out of the way when not in use;

(*b*) a Lite-O-Matic switch, which throws room light on and projector lamp off immediately and automatically, so that there is no more fumbling for switches between reels;

(*c*) a built-in editor-viewer (Model: K-161V).

The other regular features include provision for a 750-watt lamp, optical bench lens line-up for big, needle-sharp and brilliant pictures, a 400 ft. take-up reel. It has a reverse switch for editing trick effects. The projector is also capable of showing quite brilliant stills safely. It comes complete with case and a F: 1.6 colour-corrected lens.

6. Ampro "Stylist" Sound-Silent Projector:

This projector is a mere 20 lbs. in over-all weight and is ideally suited for class-room and small groups. It operates on 105-125 volt 25-60-cycle and D.C. power. Some of its main features are: a fast automatic re-wind; rheostat control to adjust film speed from 16 to 24 frames per second; triple claw protective film movement; new slideout film gate for easy cleaning; coated F: 1.6 lens; fast tilting mechanism; 2,000 ft. capacity reel arms, which are permanently attached to the main body of the projector and swivel into position and includes an "Alnico" 5-8" permanent magnet type speaker with a frequency response range of 50 to 7,000 cycles per second.

7. R.C.A. "400 Senior" Heavy Duty Portable Projector:

This is one of the higher priced portable projectors. It is a two-case equipment, both projector and speaker units are streamlined and light in weight. A 10-watt amplifier in the projector delivers

full output at less than 5 per cent distortion throughout the entire 16 mm. recording range.

This powerful, heavy-duty equipment is recommended for use in school auditoriums, large meetings and open-air shows. While this projector will accommodate up to a 1,000-watt, standard, medium prefocussed projection lamp, a 750-watt lamp is furnished with the equipment. The projector is supplied with a 2-inch, F: 1.6 coated lens and has a film capacity of 2,000 ft. It operates at both sound and silent speeds. The speaker provides wide frequency response and sensitivity. It plugs at both ends of the connection cord, which facilitates setting up and dismantling the projector for packing. The projector is mounted on the cabinet base. Separate, removable covers for each side of the projector provide great accessibility. The covers are of light weight metal, adding strength and durability to the equipment. It operates from a 105 to 125-volt, 60-cycle single phase power source.

8. RCA "400" Junior Portable Projector:

The RCA 400 Junior 16 mm. projector is an extremely portable equipment contained in a single case. The cover of the case houses the speaker, and is used as carrying space for the reels, and reel arms. The power cable and speaker cable are permanently attached to the projector and are stowed in a convenient recess in the projector base. The case is of sturdy metal construction, covered with tough, heavy, elephant-grey coated fabric. This fabric is moisture and scuff resistant, and will withstand hard usage. The case is further reinforced by external hardware finished in chrome. The reflector is made of heavily silver plated, heat resistant glass. It is factory aligned and readily accessible. The projection lamp is contained in a specially designed lamp shield, affording maximum ventilation of the heat source with a minimum of heat-conducting stray light hitting any area of the lamphouse walls. The shield opening permits only usable light to pass. A cooling system provides a high rate of ventilation for a 1,000-watt lamp either at silent or sound speeds. The blower speed is constant and independent of the mechanism speed. This is an RCA feature and thus, together with the lamp shield, results in a cool running projector regardless of the length of the programme. The condensing lens is a highly efficient, two-element system and is instantly removable for cleaning. The projection lens is a two-inch, F: 1.6 coated lens, which provides brilliant illumination and sharp pictures. Both vernier and rapid lens focusing are provided. It has a 7-watt amplifier, utilizing the "inverse feed-back" principle to assure natural tone amplification. Through elimination of the power transformer substantial weight-reduction is achieved. Good amplifier performance is maintained through use of a voltage doubling power supply. The amplifier provides a connection for a microphone or

phonograph pickup. The projector may be advantageously employed as a public address system. In short, this particular RCA model is a good buy.

9. Bell and Howell Filmosound Model 285-C (American) and G.B.—Bell and Howell Model "621" (British) Sound Projectors:

Both the above are identical in features, and are available as standard 2-case equipment or as a compact single case model for the audio-visual leader who demands exceptional portability. These projectors operate perfectly on a 105-125-volt 50-60-cycle source. Clearly marked switches are conveniently placed on the operating side and framing knob and self-locking tilt facilitate correct positioning of screen picture, The lens is focussed easily, then turned for pinpoint definition and locked-in position. To facilitate easy cleaning, every component of the optical system can be quickly removed without the use of any tools. Similarly, no tools are needed for lamp and valve replacements. The threading is swift and sure along a clearly visible path. Safe-Lock Guards grip the film over sprockets and a built-in pilot light illuminates the entire threading area. The cable terminals are designed to ensure correct connections. The capacity is 2,000 ft. of 16 mm. film for full one hour shows. It is most easy to fit the spool arms. Easy-to-get-at oiling points are located on top of the projector case. Automatic lubrication feeds the correct quantity of oil to every moving part. The detachable speaker (in the case of single unit projectors) mounted on the rear door, operates equally well alongside the projector or beside the screen. Bell and Howell projectors are among the higher priced projectors, but are ideally suitable for uninterrupted and trouble-free service in tropical climates, and are thus entirely dependable.

C. Magnetic Sound Projectors:

Introductory: Sound striping on 16 mm. film is a new development with tremendous possibilities for us in India. This means that each person can record his own sound track in the regional language with or without accompanying music and sound effects, as he wishes. This sound track can be erased and re-recorded wholly or in part, as necessity may demand. Essentially, it involves the same process as in the case of a tape-recorder, the difference being that the tape here is applied in place of the optical sound track on the film or could also be put alongside of the original optical sound track.

This of course requires a special projector, or at any rate a special attachment to the present sound projector, as in the case of the "Ampro" machines. Several manufacturers have put on the market special types of projectors. Among these are Victor, R.C.A. and Bell and Howell. These will now be considered briefly in the above order.

1. Victor's Magnesound Unit:

This is an easily installed magnetic sound attachment for any existing Victor 16 mm. sound projectors. Thus no existing Victor 16 mm. sound projector is outmoded. (Ampro has also developed a similar attachment for existing Ampro sound projectors.) The Victor Magnesound attachment is very easily, and without loss of any time, hooked on to the Victor Sound projector. Only two steps are involved in the change-over, first, to release set screw, remove optical sound drum and exciter lamp from the projector and second, to replace with Magnesound drum, tighten set screw—and the attachment is installed and ready for action.

2. The RCA Magnetic Recorder Projector:

This is a special type of sound projector incorporating the latest mechanism for recording one's own sound track. The projector itself has all the usual RCA features found in the "400" Senior model. It is an all-round projector, i.e., it records magnetic track, plays back, erases and re-records, reproduces optical track, reproduces magnetic track, operates at both sound and silent speeds and operates as public address system.

3. The Bell and Howell Filmosound "202" (American) and the G.B.—Bell and Howell "630" Magnetic-Optical 16 mm. Recording Sound Projectors (British). Both these projectors constitute all the qualities of the regular Bell and Howell projectors described above, with the additional improvement of combining a first-rate sound movie projector and a sound recorder. These projectors also are all-round in their performance as in the case of the RCA Magnetic Recorder Projector. As in both '202' and '630' the magnetic and optical sound heads are positioned together, it is easy to switch from magnetic track to optical track, or vice versa, during actual projection. A lever mounted over a plate marked MAG—OPT swings the sound turret on to the desired track, while a snap lock ensures positive alignment in either position. Accidental erasure is virtually impossible. The record button must be pressed to start the recording mechanism, and only then will the previous recording be erased. Whenever the reverse switch is used or the motor shut off, the recording mechanism is automatically disconnected. A warning light, which goes on as the record button is pressed, keeps the operator constantly reminded that he is recording. Separate or simultaneous recording of voice and music on the magnetic sound track is made possible by the mike and disc plugs. Thus, for rich dramatic colour, music background and sound effects can be easily mixed with commentary.

RECORDING EQUIPMENT

1. Pentron 9T-3C Portable Duo-Speed Tape Recorder:

This dual track (also available with full track heads) tape

recorder is simple to operate, is fool-proof and entirely dependable. It is portable and self-contained with two-speed recording and play-back, extremely fast forward and rewind speeds, editing key and an interlock switch. It is capable of recording for two full hours through its own microphone or direct from any radio or record-player. It plays back through its own Alnico speaker or through any external speaker, radio or amplifier. Speed from $7\frac{1}{2}''$ to $3\frac{3}{4}''$ is easily accomplished by a simple push-pull switch. It comes complete with a crystal microphone, a plastic reel and is housed in attractive two-tone leatherette luggage type case with a plastic handle. Other specifications include a frequency range of 50-8,000 cycles at $7\frac{1}{2}''$, 50-5,000 cycles at $3\frac{3}{4}''$ per second, 2 high impedance inputs and two outputs—one for external speaker and the other for amplifier. The power output is 5 watts, while the power required to run the recorder is 105-120 volt, 60 cycle AC. The over-all weight is only 27 lbs. A special spindle is available to change the recorder for use on a 50 cycle current. While the recorder is available with either a single track or a double track recording head, if any editing is to be done, it is advisable to go in for a recorder fitted with a single track recording head. This tape recorder is ideally suited for all semi-professional jobs. However, for professional work the following instruments are best suited:

2. FERROGRAPH Series 2 Tape-Recorder:

The main object of the Ferrograph is to provide at a reasonable cost an instrument approaching professional standards. Although primarily not intended for use in the home, its reasonable price and pleasing appearance in no way preclude it from such usage. Its specification however will always commend it to the demands of those engaged in scientific, cultural and educational pursuits. Some of its main specification comprise of: (i) a synchronous capstan motor, which provides a high degree of longterm speed stability, thereby avoiding pitch errors on replay; (ii) provision for acceptance of large reels giving 45 minutes uninterrupted playing time per track at $7\frac{1}{2}''$ per second; (iii) edition of a fading facility, which enables, (*a*) super-imposition of commentaries on previously recorded material, (*b*) the erasing of unwanted passages unobtrusively without clicks or other discontinuity phenomena, and (*c*) the safeguarding of valuable recordings against accidental erasure; (iv) An endless loop cassette attachment, which converts the recorder into an endless loop machine, (this attachment is of great value in rehearsal work, fault analysis and other specialized uses); (v) a monitor meter on a sustained peak reading basis, thereby allowing accurate professional control of recording level, as opposed to the indefinite magic eye device more often employed, thus ensuring maximum signal-to-noise ratios with a minimum of distortion; (vi) provision of an auxiliary power supply socket on the front panel to

further extend the scope of the instrument; and (vii) facilities of two speeds, two tracks, single knob selector control, auto stop switch, tone controls, very fast forward and rewind, cueing scale and 15 ohm. extension speaker socket.

The power consumption of this instrument is 110 watts and its working voltage is 200-250 volt AC. The Ferrograph is a British production of high quality and is available in India at a price of Rs. 2,250.

3. Magnecorder—PT63 and PT63-J:

This instrument developed from the world famous PT6 series, offers the same wide-band response and fidelity, plus the new three head assembly to monitor directly from the tape while recording. Separate erase, record and playback heads are triple shielded to prevent cross-talk and hum and each can be individually aligned or replaced. The PT63-A model comes complete with capstans for $7\frac{1}{2}''$ or $15''$ tape speeds, but a third speed or $3\frac{3}{4}''$ is obtainable with the inclusion of a two-speed hysteresis synchronous motor. Dual track heads are also available at slightly extra cost. The matching amplifier unit for the PT63—A is the model PT63—J, which has separate record and playback amplifiers. This enables simultaneous playback of tape while recording. It has a single low-impedance microphone input and also a bridging input. Further, it has a 600 ohm, balanced, zero level output, 10 watts of audio with terminals for external speaker and a $5''$ monitor speaker. It includes a switch for $7\frac{1}{2}''$ or $15''$/sec. tape speed equalization, another for reading bias, record or playback on $3''$ or $4''$ VU meter. The model PT63-AH has an additional Hi-speed forward feature for fast cueing or editing. The Magnecorder manufacturers have a variety of accessories for every purpose, making these tape-recorders one of world's most versatile tape-recording equipment. Such details will be provided post-haste on request directly to the manufacturers, their agents or any of the Field-Directors of the National Christian Council's Committee on Audio-Visual Aids.

PUBLIC ADDRESS SYSTEMS

1. The David Bogen Public Address Equipment:

(i) Model IM-66: This is an amplifier most suitable for mobile use, since it works both from 6-volt battery and 220-volt AC mains.

Specifications: Power output—8 watts peak; Frequency response —60-9,000 cycles; Gain—Microphone Channel: 110 Db, Phono Channel: 75 Db; Input impedance—500,000 ohms; Output impedance—4, 8, 15 ohms; power consumption—50 watts on AC, 42 watts on battery; Tubes—1-6SJ7, 1-6SL7GT, 1-6L6G and 1-6X5GT; Dimensions—6 1/8" × $9\frac{1}{4}''$ × 6 7/8"

This is priced in India at Rs. 540 only.

(ii) Model H30: This amplifier is suitable for outdoor as well as indoor use, where large power is required. It works directly from a 220-volt AC mains. This model features a six-position tone corrector, two microphone and one phono inputs, each with separate controls and arrangement for mixing, a high-gain pushpull circuit and recessed carrying handles.

Specifications: Power output—30 watts; Peak output—40 watts; Frequency response—30 to 12,000 cycles; Gain—Mike: 119 Db., phono: 77 Db.; Input impedance—Mike: 2 megohms, phono: .5 megohms; output impedance—4, 8, 16, 500 ohms and 70 volts; Power consumption—140 watts; tubes—3-6SF5, 1-6SL7GT, 2-6L6G, 1-5U4G; dimensions—$15\frac{1}{2}'' \times 10\frac{3}{4}'' \times 7\frac{1}{2}''$

Price in India: Rs. 930 only.

(iii) Model: CB. 30: This is a medium priced 25 watt amplifier—works both from 6-volt battery and 220-volt AC mains—with 2 microphone inputs and one phono input.

Specifications: Power output—25 watts; Frequency response—30-12,000 cycles per second; Gain—mike: 118 Db., phono: 85 Db.; Output impedance—4, 8, 15 ohms and 70 volts; tone-control—Selectone, 4 position: deep base, mellow, crisp and brilliant; tubes—2-6SC7, 1-6SL7, 2-6L6G, 1-7Z4; dimensions—15″ x 10″ x 8″

It is priced at Rs. 740 only in India.

2. Knight Public Address Systems:

(i) Knight "Little Giant", 8-watt Amplifier: This amazingly powerful compact amplifier features low initial cost combined with economy in service. It covers upto an area of 20,000 sq. ft. when used with trumpet speaker. There are separate input controls which permit blending or mixing microphone and phono. It has two speaker sockets. The power on-off switch is on the tone-control. It works on 110-130 volt 50-60 cycle AC. Coverage with an ordinary speaker is upto 5,000 sq. ft., sufficient for an audience upto 1,000 persons.

(ii) Knight 15-watt Amplifier: This is a dependable piece of equipment and is ruggedly constructed, giving a full 15-watt output. Thus this amplifier is suitable for larger audiences and when used with trumpet speakers, it easily covers an area upto 50,000 square feet. This amplifier is also available with a 3-speed phono top, which plays all records—78, 33 1/3 and 45 r.p.m. The combined amplifier-phono system comes complete with a constant speed motor, pickup with turn-over crystal cartridge and 2 precious metal-tipped needles. It also includes a switch, arm-rest and plug-in connections.

Originally available. for 60-cycle operation, with special bushing it can be adapted for 50-cycle operation at a nominal extra cost.

(iii) Knight's 25-watt Universal 6V-110V P.A. System: Here is a universal sound system that is engineered and built for the most rugged mobile or stationary service. It provides powerful coverage of areas up to 85,000 square feet. The system works anywhere, i.e., it may be operated from any 6-volt automobile storage battery or from 110-130 volt 50-60 cycle AC. Whichever way it is hooked-up, the output is a full 25 watts. It has two high impedance microphone inputs and one phono input. Instant control over "mixing" and fading is possible. A built-in record player is optional. There is a wide selection of speaker output impedances. A tone-control for simple accoustical correction is incorporated in the amplifier.

RECORD PLAYERS: TRANSCRIPTION PLAYERS:

1. "Califone" Transcription Player: Model 12-V-P2:

This is a precision instrument, with dependable long-term service and high quality reproduction. The turn-table speeds may be set to 33 1/3, 45 or 78 R.P.M. by means of a sliding lever at front left-hand side of the turn-table. It has an input for high-impedance microphone and separate controls for microphone and phono output volumes, thus making it possible "mixing" and "fading" This model is equipped with "Varipole" variable speed control. The turn-table speed may be adjusted above or below normal. A bushing is available on demand for adapting this instrument for 50-cycle use in India. The most significant feature of this instrument is that although it is a one unit model, yet the cover contains a 12″ Jenson Concert type of speaker, giving an excellent reproduction of both records and voice. The cover with the speaker is detachable for placement at a remote place. The writer of this chapter highly. recommends this Transcription-cum-PA System-Player. The working voltage is 105-120 volt AC. AC-DC models are also available in this make.

2. Bogen 1016X Transcription Player:

This is a portable 3-speed transcription player for 78, 33 1/3 and 45 r.p.m standard and micro-grove records up to 17½″ It incorporates a heavy-duty 4-pole motor and speed regulator to increase speeds up to 10% and decrease speeds up to 15%. The pickup is Astatic 400 LQD model with a double needle crystal cartridge with arrangement for connection to phono input or amplifier or radio. It is housed in a reinforced plywood case covered with durable leatherette. The instrument operates on 110-volt 50-60 cycle AC.

3. GARRARD "Crest", Model "T" 3-speed Manual Record Player:

Here, at a moderate price, is the manual record playing machine perfected by Garrard for record enthusiasts who demand perfection

in playing performance and who prefer to play one record at a time. This model adjusts precisely to all speeds, 33 1/3, 45 and 78 R.P.M. Simple, fool-proof operation! The unit is started by moving tone arm to right, shuts off automatically at end of record. It is equipped with interchangeable plug-in heads to accommodate any crystal or magnetic cartridge, and has a special adapter disc for 45 R.P.M. records. It is available for 200/250, 50-cycle AC mains.

PROJECTION SCREENS:

1. Radiant "Educator" Projection Screens:

The "Educator" is a portable tripod model projection screen, designed for the regular user of projection equipment and manufactured in sizes to accommodate audiences up to 150 persons. The screen case is made of slotted metal. Roller pins and brackets are concealed by chrome-plated metal-end caps. The screen case is closed tightly by a batten with plastic-end tips. Height adjustment is accomplishment through carrying handle containing auto-lock mechanism. In regard to the fabric of the screen, the Radiant "Perma-White" Vyna-Flect glass-beaded surface is mildew-proof and flame-proof and will withstand a light surface wash with damp cloth. The fabric is attached to spring roller so that it cannot be torn from roller when extending screen to expose entire effective picture area, when making height adjustments or when screen is entirely unwound. Picture size for both rectangular and square sizes is stamped on back of fabric. Black borders mask the picture area for sharpness in projection. The height adjust is continuous. The screen hanger is die-cast and is designed for special "Screen-Leveller" hanger which permits horizontal adjustment of screen fabric to compensate for uneven floors. A locking button is provided to permit screen case to be positively locked in correct position for closing screen when not in use. The tripod legs are constructed of heavy gauge aluminium, capable of supporting 200 lbs. in weight. The legs fold against upright support in securely locked position in carrying position. Foot tab unlocks legs which open automatically with spring-loaded action. The tripod legs are provided with plastic tips to prevent slipping or scratching of floors. These screens are available in sizes ranging from 37″ x 50″ to 70″ x 70″.

2. The "Stow-A-Way" Mat-White Projection Screen:

This is an easy-to-carry screen, can be set on table, bench or desk. It can also be hung on a wall from a single hook and levels automatically. The Mat-White fabric of the screen enables wide-angle viewing and better details. Further, the screen surface will not crease or wrinkle and is easily washable. The screen comes with a compact case which is easy to carry, being only 37″ long, 3″ in diameter and weighing 6½ lbs, being only 36″ x 36″ in size, its use is limited to a

class-room or a Sunday School class or a small village group. For larger groups, the "Fast-Fold" model, by the makers of the "Stow-A-Way" screens, is recommended.

3. "Weston" Matte-White Screens:

These are available in India in various sizes, for wall or ceiling suspension or with tripod for floors.

4. A home-made super-screen and yet cheap:

A piece of white oil-cloth from the bazaar can make a very efficient and durable screen The usual width of the oil-cloth is 4 feet or thereabouts. If a screen 8′×8′ is required, two 8′ pieces in length may be sewn or glued together. It is important, however, that the oilcloth should not only be white, but it should also be of fine pebble grain, for the plain-surface oilcloth will give glare.

This oilcloth of the right variety may be mounted on a long thin piece of wood at top and bottom, leaving the wood or stick to project 3 inches or so for hanging on a spike in a wall or on bamboo up-rights, set in the ground. The best way to set the screen may be decided upon according to the place where the screen is to be used. Such a screen folds up into a roll, and, moreover, is easily washed when spotted by insects, etc.

MICROPHONES

The selection of a microphone depends on a number of factors and the reader is advised not to go in for a microphone at random or just because he is striking a good bargain. Among the factors to be considered, one is this: To what piece of equipment are you planning to hook-up? Whether the microphone input of this equipment is of high or low or medium impedance. Whether the same microphone is to be used with more than one piece of equipment, in which case, it may be that the microphone input impedances vary and therefore it may be necessary for you to purchase a multi-impedance type of microphone. Secondly, to what use are you going to put this microphone? Are you planning to use it for outdoors or under studio conditions? Is it to be used for talks, sermons and announcements or is to be used for choir-singing or orchestras or on a drama stage? Its use will decide for you whether you should go in for a uni-directional, bi-directional or non-directional type of microphone. Microphones to suit all purses are now available in the local market, but it is advisable to buy a sturdy weather-proof microphone of more than average quality. It will pay you in the long run to spend a little more and buy a good quality microphone. However, make sure that you do not buy a crystal microphone, for these are not suitable for tropical countries. Dynamic microphones manufactured by Turner, Shure, R.C.A. or Electro-voice are durable and with reasonable care, should give long and efficient service.

GENERATORS

1. Homelite "Carryable" Generators:

Either of the models 23A115 (Capacity 1,500 watts) or 24A115 (Capacity 2,500 watts), petrol engine driven and producing 115-volt 60-cycle single phase alternating current, will suffice for operating one or more of the equipment listed in these pages. These generators are complete self-excited power plants, supplying a steady voltage, which can be regulated by the help of an incorporated voltmeter. These are light in weight when compared with other makes, which is an important factor for consideration when transportation facilities are so limited in the villages of India.

2. Universal "Matched Unit" Electric Plants:

Either of the three following models would be suitable for operation of a movie projector or equipment with lower wattage:

2100-B—110-120 volt, manual control, 1-phase, 2-wire;
*2100-ES—110-120 volt, electric starting, 1-phase, 2-wire;
*2100-BR—110-120 volt, automatic starting (Remote control), 1-phase, 2-wire.

Some of the features include an efficient oil bath air cleaner, bowl type petrol filter, new magnematic ignition system with breaker points, condenser and stop switch externally mounted, adjustable float feed carburettor, vented blower housing, adjustable fully enclosed mechanical governor, six quart petrol tank and fittings muffler, crankcase breather and rope starter. (Hand starting crank is also available.) In weight, however, these generators are heavier than the Homelite models mentioned above.

MISCELLANEOUS ACCESSORIES

These include transformers, pickup arms and cartridges, invertors, projection lamps, exciter lamps, pilot lamps, microphone stands, long-playing and transcription records, magnetic recording tapes, valves, photo-electric cells, film splicers, projector stands, rewinders, spools, etc., etc.

These are not being discussed here, but in case any details are needed concerning these and other accessories, interested parties may do well to contact any of the Field-Directors of the Audio-Visual Aids Committee of the National Christian Council of India.

CONCLUSION

In closing this chapter the writer would like to leave with the reader one or two points of advice. When purchasing any electronic equipment be certain, not only to see that the accompanying litera-

* These models can deliver AC and DC at the same time, when desired.

ture contains a set of instructions for operation and maintenance of the equipment, but also that it includes servicing hints and a schematic diagram of the electronic circuit of the equipment. This latter is of immense help and sometimes is essential for the serviceman for trouble-shooting when the equipment needs repairs or replacement of parts. Secondly, it is always good to include a set of spares for the equipment that you are buying at the time of purchase, for it may be that sooner or later when you need to replace, say, a valve, its replacement may not be available in the local market. Finally, this is a proved fact that you can never be too careful in handling any audio-visual equipment.

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NORTH INDIA

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A large amount of Audio-Visual materials are stocked, published by the A-V.A. Committee, Christian Home Committee, Christian Medical Association and others, such as flannelgraphs, flash cards (as the Jet Series on Health), posters, books, Indian Christian art, Christmas cards, etc. A complete price list is available, free. We are glad to send out shipments on approval.

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